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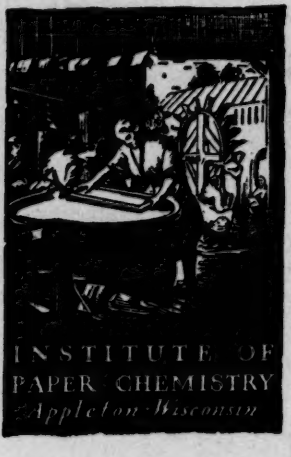
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

JULY • 1952

Volume 22 Number 11

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THE INSTITUTE OF PAPER CHEMISTRY

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Books and Pamphlets Added to the Library During June

CHEMISTRY, ANALYTIC—QUANTITATIVE

FOULK, CHARLES W., MOYER, HARVEY V., and MACNEVIN, WILLIAM M. Quantitative chemical analysis, an introduction to the science and practice of chemical measurement. New York, McGraw-Hill Book Co., 1952. 484 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1952. 17. Band. 623 p.

ENGINEERING—BIBLIOGRAPHY

The ENGINEERING INDEX, 1951. New York, Engineering Index, Inc. [c1952] 1383 p.

FOREST PRODUCTS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. Yearbook of forest products statistics, 1951. Rome, The Organization, 1951. 182 p.

FORESTS AND FORESTRY

KOROLEFF, A. Stability as a factor in efficient forest management. Woodlands Research Index No. 89 (A-2-a). Montreal, Pulp and Paper Research Institute of Canada, 1951. 294 p.

MARKETING (DOMESTIC ECONOMY)

RANDALL, LOIS E., and SHARPNACK, DOROTHY M. Market research sources; a guide to information on domestic marketing. U. S. Department of Commerce. Domestic commerce series no. 20. Washington [U. S. Govt. Print. Off.] 1950. 261 p.

NEWSPRINT

U. S. CONGRESS. SENATE. *Select Committee on Small Business.* Newsprint for tomorrow; report and conclusions, including individual views of Mr. Thye and statement of Mr. Schoeppel, presented by Mr. [Hubert H.] Humphrey. 82d Congress, 2d session. Report no. 1404. Washington, U. S. Govt. Print. Off., 1952. 239 p.

PACKAGING

[DOBBINS, C. E., and HOECKER, R. W.] Costs of and reasons for rewrapping prepackaged meats, poultry, and cheese. U. S.

Dept. of Agriculture. Production and Marketing Administration. Agriculture information bulletin no. 77. Washington [U. S. Govt. Print. Off.] 1951. 34 p.

PAPER MAKING AND TRADE

[APFELBAUM, HANS JACK] Case study data on productivity and factory performance, pulp and paper mills (based on reports submitted by 18 selected pulp and paper mills). Prepared for Mutual Security Agency, Productivity and Technical Assistance Division by United States Department of Labor, Bureau of Labor Statistics. Processed, 1951. 64 p.

CASEY, JAMES P. Pulp and paper; chemistry and chemical technology. New York, Interscience Publishers, 1952. v. II. Properties of paper and converting. p. 797-1405.

PAPER MAKING AND TRADE—DICTIONARIES

GIANNI, ENRICO. Industria cartaria; carte, cartoni, cartoncini. Fabricazione, caratteristiche, usi, con 5 dizionari dei termini tecnici nelle lingue italiana, francese, inglese, tedesca e spagnola, seguiti da una sintese storica. Milano, Editore Ulrico Hoepli, 1951. 324 p.

PAPER SIZING

NINCK BLOK, CONSTANTINUS JACOBUS JOAN. Het lijmen van papier als colloidchemisch verschijnsel. Proefschrift ter verkrijging van de graad van doctor in de technische wetenschap aan de Technische Hogeschool te Delft . . . Haarlem, Joh. Enschedé, 1952. 105 p.

PHOTOSYNTHESIS

SOCIETY FOR EXPERIMENTAL BIOLOGY. Carbon dioxide fixation and photosynthesis. Symposia of the Society . . . no. 5. New York, Academic Press, 1951. 342 p.

RAYON

GÖTZE, KURT. Chemiefasern nach dem Viskoseverfahren (Reyon und Zellwolle). 2 neubearb. Aufl. von Kunstseide und Zellwolle nach dem Viskoseverfahren. Berlin, etc., Springer-Verlag, 1951. 739 p.

STATISTICS

U. S. BUREAU OF THE CENSUS. Annual survey of manufactures: 1949 and 1950, prepared under the supervision of Maxwell R. Conklin. Washington, U. S. Govt. Print. Off., 1952. 182 p.

TERPENES

SIMONSEN, JOHN L., and BARTON, D. H. R. The terpenes. [2d. ed., rev.] Cambridge, University Press, 1952. v. 3. The sesquiter-

penes, diterpenes and their derivatives, with addenda to volumes I and II by Sir John Simonsen and L. N. Owen. 579 p.

UNITED STATES—ECONOMIC CONDITIONS

WARDWELL, CHARLES A. R. Regional trends in the United States economy. U. S. Office of Business Economics. Washington, U. S. Govt. Print. Off., 1951. 121 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

LENZ, EARL C., and STONE, RAYMOND. Resin adhesives. Modern Packaging 25, no. 10: 94-7, 180, 182 (June, 1952).

The principles involved in the formulation of synthetic-resin emulsions, their advantages as adhesives, and suitable methods of application to packaging problems are reviewed. In conclusion, useful directions for handling these adhesives are given to obtain the most satisfactory results. 10 figures. E.S.

ALUMINUM

PACKAGING PARADE. Delivered in its baking container. Packaging Parade 20, no. 233: 86-7 (June, 1952); *cf.* B.I.P.C. 22: 559.

The Kitchens of Sara Lee, Inc., Chicago producer of baked goods, now delivers its coffee cakes in the aluminum foil containers in which they are baked. The only paper used in final packaging is a cellophane-windowed boxboard disk which serves as a cover and is held in place by the crimped edges of the foil pan. 4 illustrations. L.C.

ASSOCIATIONS

AUSTRALIAN PULP AND PAPER INDUSTRY TECHNICAL ASSOCIATION. Condensations of papers presented at Australian Pulp and Paper Industry Technical Ass'n. conference, 1952. Paper Trade J. 134, no. 24: 35-7; no. 25: 32-5 (June 13, 20, 1952).

Abstracts of 16 papers presented at the fifth Australian Pulp and Paper Industry Technical Association conference, 1952 are given. 3 tables. L.C.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section.* Joint meeting of the Technical Section Executive Council with branch and committee chairmen, March 18, 1952. Pulp Paper Mag. Can. 53, no. 6: 121-7, 132 (May, 1952); *cf.* B.I.P.C. 21: 380.

Summaries of the reports by the different chairmen are given. E.S.

PULP & PAPER. Industry organizations and their leaders 1952-1953; associations and institutes. Pulp & Paper 26, no. 7: 30-1 (July 1, 1952); *cf.* B.I.P.C. 22: 3.

The associations of the United States and Canada are listed, including photographs of presidents and chairmen, and office addresses. E.S.

BAGASSE

ANON. Cane sugar bagasse offers new source for newsprint. Chem. Eng. News 30, no. 26: 2708 (June 30, 1952); Paper Mill News 75, no. 27: 11-12 (July 5, 1952); Paper Trade J. 134, no. 25: 12 (June 20, 1952); Chem. Eng. 59, no. 7: 286, 288-90, 292

(July, 1952); Tappi 35, no. 7: 104-6A (July, 1952); *cf.* B.I.P.C. 21: 763.

W. R. Grace & Co., owners and operators of the bagasse pulp and paper mill at Paramonga, Peru held a conference in New York in early June, where they outlined their commercial papermaking process for making bagasse papers. The Paramonga mill is currently producing about 20,000 tons annually of wood-pulp and bagasse papers; the grades vary from airmail bonds to book, multiwall-bag, and containerboards in qualities and prices competitive in the Peruvian market. Varying percentages of bagasse are used with wood pulp; however, many grades, such as corrugating board and printing papers, are 100% bagasse. In 1950, the company made 900 tons of newsprint as a service to the Peruvian press; however, the profit margin was not attractive. Any bagasse pulp and paper operation in the United States will find it vital to control its bagasse supply. The Sandy Hill Iron and Brass Works are licensed to build the machinery for the process which Grace has developed. Although all five articles refer to the same conference, their text is not identical. 2 illustrations in the first two, 5 in the third, 7 in the fourth, and 3 in the last reference. E.S.

ATCHISON, JOSEPH E. Processes available for production of pulp from sugar cane bagasse. Paper Trade J. 134, no. 25: 24, 26-9, 35-6 (June 20, 1952).

The production of good quality pulp from sugar-cane bagasse can be undertaken successfully by large, highly efficient mills which are willing to experiment with processes now being used for producing bleached straw pulp. The author discusses batch-type (the soda, Marsoni, sulfate, sodium monosulfite, acid sulfite, and mechanochemical) and continuous processes (the Huguenot, Celdecor-Pomilio, Morley, and Kamyr processes). He points out that both batch-type and continuous processes will produce high-grade pulp and that the alkaline processes, the monosulfite process, or variations of these are more suitable than the acid sulfite process. The choice of the method used depends greatly upon economic conditions existing at the mill site. Small inefficient mills should not enter the bagasse field, especially if they do so under the false hopes of a miraculous "secret process" for cane-pulp production. L.C.

VALITE CORPORATION, *New Orleans and Lockport, La.* New bagasse pulping process uses whole cane. Paper Trade J. 134, no. 25: 14 (June 20, 1952); Paper Mill News 75, no. 26: 39 (June 28, 1952); Southern Pulp Paper Manuf. 15, no. 7: 16 (July, 1952); *cf.* B.I.P.C. 13: 155-6.

A brief reference is made to a new process by which paper, including newsprint, can be made from 100% whole bagasse, i.e., pith and fiber. E.S.

BARKERS AND BARKING

WILSON, TOM. The hydraulic slab barker operation in the MacMillan and Bloedel pulp mill at Port Alberni. Pulp Paper Mag. Can. 53, no. 6: 111-15 (May, 1952); Can. Pulp Paper Ind. 5, no. 6: 12, 14, 16 (June, 1952).

The experience of the MacMillan and Bloedel pulp mill with slab barking operations is presented, with a description of the barker as originally installed and an outline of its function at Port Alberni. The effect of changes made in the barker with relation to production rate and maintenance costs and its limitations are discussed. 5 figures in the first and 1 figure in the second reference. L.C.

WULTSCH, FERDINAND, and SALZER, HEINZ. Studies concerning the suitability of wet barking for nonfloated pulpwood in the Alps. Das Papier 6, no. 5/6: 75-80; no. 7/8: 115-19; no. 9/10: 169-76 (March-May, 1952). [In German]

In an extensive study for determining the most efficient barking process for winter-cut logs with adhering bast and bark in the Alps, the principles of the Streambarker (I) and the Thorne (II), Schongau (III), and Kamyr (IV) barkers are described. In actual mill-scale experiments, the relationships between storage period (up to three years), diameter of log, degree of adhering bast and bark, degree of barking, loss on peeling and percentage of wood loss, power consumption, and output of the different systems were established, and the results are presented in a number of diagrams. The investigations gave the following general results: all barking systems under discussion work unsatisfactorily with nonfloated, unbarked, winter-cut wood unless it has been soaked, preferably in hot water. (I), (II), and (IV) work continuously, whereas (III) is a batch operation. The output of (I) per man and hour is the highest, followed by (II), (IV), and (III). (I) shows also the highest power consumption, and (IV) the lowest. The loss in wood without previous soaking is highest in (I) and lowest in (III). Decayed and surface-cracked wood cannot be barked satisfactorily in (I) and in (III) only when certain precautions are observed; with this type of wood (IV) gives the best results. Crooked and branched wood is best treated in (I) and (IV); (II) is quite unsuitable in this case. (III) gives the best and most economical results with small-diameter wood, particularly tree tops. Photographs of logs depicting the degree of barking obtained under these different conditions are included. The following directions may be of assistance in the selection of a new installation: (I) is recommended for the treatment of unbarked, sound logs of large diameter in localities where power and wood prices are high and labor is scarce; it is particularly suitable for large daily outputs. (III) should be considered in localities where high wood and low power prices and moderate wages predominate. It is particularly suitable for minor operations and the conversion of (principally) small-diameter wood. For very large outputs and high power costs and wages, preference should be given to (II) and (IV), particularly if combined with suitable presoaking installations. 41 figures. E.S.

BEATING

IVANOV, S. N. Effect of beating on the properties of pulp and paper. Bumazh. Prom. 25, no. 3: 10-19 (May-June, 1950). [In Russian]

A series of laboratory and mill tests was made on unbleached sulfate and bleached sulfite pulp to study the relationship of beating degree to fiber length, breaking length, tear, absorptivity, and air permeability. The results of the investigation are presented in tabular and graphical form. 2 tables and 14 figures. E.G.S.

TOLVI, ERKKI K. Hydrafiner refining. Svensk Papperstidn. 55, no. 9: 316-20 (May 15, 1952). [In English] *cf.* B.I.P.C. 22: 315-16.

This is an English translation of the Finnish original. 4 tables, 22 figures, and 10 references. E.S.

BENTONITE

LOPEZ-GONZALEZ, JUAN DE DIOS, and DIETZ, VICTOR R. Surface changes in an original and activated bentonite. J. Research Natl. Bur. Standards 48, no. 4: 325-33 (April, 1952).

The physical adsorption of nitrogen was used to study a bentonite activated by a treatment with hydrochloric acid. The Brunauer-Emmett-Teller equation, the Hüttig equation, and a so-called "summation" equation were used in the calculation of the surface areas available to nitrogen. The changes in surface area at different temperatures have been related to the quantity of adsorbed water and the amount of constitutional hydroxyl groups. The surface area is a measure of only the external boundary (nonswelling surface) of the bentonite, and this is increased significantly by the activation process. The ratio of surface areas (activated to original) is about four. A maximum in the surface area was found to exist when all the adsorbed water was eliminated. However, the surface area decreased with the removal of water formed by the decomposition of the constitutional hydroxyl groups. Chemical analyses, dehydration curves, thermal differential analyses, x-ray patterns, and electron micrographs were employed to characterize the materials. 4 tables, 11 figures, and 33 references. E.S.

BLACK LIQUOR—OXIDATION

WRIGHT, R. H. Kinetics of the oxidation of sulphate black liquor. Tappi 35, no. 6: 276-80 (June, 1952); *cf.* B.I.P.C. 22: 314.

The rate of oxygen absorption from moist air at one atmosphere pressure between 40 and 90°C. by sulfate black liquor has been studied; a description of the modified respirometer used is given. The results are interpreted on the basis of simultaneous reactions, including a first-order reaction which is dominant in the first part of the process and which is succeeded by slower reactions which continue indefinitely. The oxidation of sodium sulfide is considered to take place largely during the initial phase of the reaction. The first phase requires a period of two to three minutes for completion; this is the reaction time when the black liquor is given a large specific surface. At smaller values of specific surface the time would be materially longer; on the other hand, it would not be appreciably shortened if the surface were still further increased. Between 60 and 90° temperature has very little effect on the specific reaction rate, probably because the partial pressure of oxygen falls as that of water vapor rises. The reaction time is therefore substantially constant in this temperature interval. One volume of black liquor requires from one to three volumes of oxygen or from five to 15 volumes of air for complete oxidation of the sodium sulfide. In practice larger volumes would have to be supplied so that the reaction would not be retarded by a fall in the partial pressure of oxygen. Sodium sulfide and methyl mercaptan are oxidized more rapidly in black liquor than in aqueous alkali, probably because of the presence of catalysts derived from the wood. The experiments suggest that nothing is gained by increasing the specific surface of the black liquor beyond a certain point, and it is doubtful that foam production in practical black-liquor oxidation is a necessity. 9 figures and 3 references. E.S.

BLEACHING—SULFATE

VAN NEDERVEEN, G., VAN ROYEN, A., and VAN DER VEEN, J. The bleaching of sulfate pulp. Papierwereld 5, no. 11: 441-7 (June, 1951); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 28, no. 7-9: 53-4 (July-September, 1951). [In Dutch; abstract in English]

Data in the literature on the bleaching of sulfate pulps were checked in a series of experiments. Bleaching in this case depends upon the oxidation of the coloring materials to give lighter or even white products. Bleaching completes the pulping process, because it removes lignin residues and other components which are detrimental to papermaking. The cellulose itself, however,

may be seriously degraded, unless the correct conditions are selected. The use of sodium chlorite is recommended; it was used in the present investigation as a 20% aqueous solution. The higher the oxidation potential of a bleaching agent, the stronger is its effect. A comparison of the variations of this potential for sodium hypochlorite, sodium chlorite, and hydrogen peroxide with changes in pH showed that sodium hypochlorite is the most powerful of the three, but reacts only in neutral (when the cellulose is strongly degraded) or alkaline media, with decreasing rate of activity as the alkalinity increases. In an acid medium, it is equivalent to chlorine water. Both sodium chlorite and hydrogen peroxide are active over the entire pH range, decreasing with increasing alkalinity. This decrease is least around pH 6. Sodium chlorite has a consistently higher oxidation potential (0.95-0.55) than hydrogen peroxide (0.75-0.35) over the pH range of 2-11. The extent to which the cellulose and the accompanying substances can be oxidized determines the pH at which the sodium chlorite should be used for the most favorable results. At least one mill in Sweden uses chlorite for the bleaching of sulfate pulp; the most economical results are obtained when it is applied in the final bleaching stage and better brightness values result. The cuprammonium viscosity or its opposite, fluidity, was used as a criterion of cellulose degradation. A table is included which shows that sodium chlorite has a less degrading effect than sodium hypochlorite. The removal of the reaction products formed by alkaline washing is an important step in bleaching. Aging tests indicated that both the samples and commercial pulps show good permanence, although some yellowing occurred; this could be reduced to a minimum when alkaline hydrogen peroxide was employed in the final stage. Beating the samples in the Lampén mill showed that bleaching increases the beating rate for both bleached and unbleached sulfate pulps; the breaking length, however, is independent of bleaching. 5 tables, 4 figures, and 9 references in the original. E.S.

BOARD

KING, F. W., and BENDER, F. Production of hard-pressed fibreboard from western red cedar mill waste. Pulp Paper Mag. Can. 53, no. 6: 137-41 (May, 1952); *cf.* B.I.P.C. 21: 502-3.

Western red-cedar shingle mill waste has been used to prepare hard-pressed fiberboards which contain the components of this waste in varying proportions, with and without binders. All these boards have a satisfactory appearance and texture. Although a certain number of the boards produced do not meet existing strength requirements, they are considered suitable for many purposes. Boards from the wood component meet the high requirements of the Federal specification for "Class A" hardboard. Boards which meet the British standard for "hardboard type" of fiberboards can be made from bark alone, from the wood and bark fractions, or from the wood, bark, and shingle-hay fractions. Boards from the shingle-hay and sawdust fractions alone do not meet the Federal specifications or the British standard for a hardboard; however, it is felt that these boards could replace, in many applications, stronger fiberboards now in use. The addition of a binder pulp, prepared from waste material or carboxymethylcellulose, leads to increased strength. This is shown to be a suitable method of upgrading poor-quality pulps. 2 tables and 3 references. E.S.

KOLLMANN, FRANZ. Manufacture and properties of wood-chip boards. Paper and Timber (Finland) 34, no. 5: 202-4 (May, 1952). [In German] *cf.* B.I.P.C. 22: 729-30.

Essentially the same information in condensed form is presented as in the previous article. E.S.

ROHM & HAAS COMPANY. *Resinous Products Division.* In the chips. Resin Rev. no. 4: 15-16 (May, 1952).

A brief reference is made to a recent development in the field of low-cost, boardlike compositions, a form of reaggregated wood called "chipcore." It is produced by tumbling graded wood chips (preferably 75% softwood and not more than 25% hardwood) with a suitable binder and then hot pressing the resulting mixture. The Uformite resins are excellent binders for this type of product; they yield a rigid board which can be machined and shaped readily into core stock for plywood, roofing and subflooring, and similar applications. 2 tables. E.S.

BOARD, ASBESTOS

GRIFFITHS, L. H. The advent and use of the decorative thermoplastic floor tile. Chemistry & Industry no. 20: 432-6 (May 17, 1952).

A detailed description is given of the manufacture of thermoplastic floor tile, a product consisting of 40-50% short asbestos fiber (grade 7R), 25-30% resin binder (prepared from the unsaturated fraction of coal tar naphtha), and limestone as a bulk filler. Necessary precautions in the application (to rigid bases only) and the limitations of the material are discussed; in the United States the product is usually known as asphalt tile. 8 illustrations. E.S.

BOARD, CORRUGATED

KINCK, H. E. Corrugated board and the kollergang. Norsk Skogind. 6, no. 5: 150 (May, 1952). [In Norwegian]

The author postulates that the suitability of the corrugating material depends to a large extent upon its treatment in a kollergang, whose specific action produces a better felting pulp than any other stock-preparation treatment. The need for the development of a machine which gives the same favorable results as the kollergang without involving its high power consumption is emphasized (*cf.* Brecht, B.I.P.C. 22: 179). E.S.

BOARD, LAMINATED

ANON. Lamination achieves speed and quality. Pulp & Paper 26, no. 6: 48 (June, 1952).

By running a 42-lb. sheet on its Fourdrinier board machine and laminating two thicknesses with starch, Southern Paperboard Corp. at Port Wentworth, Ga. is able to obtain more production than it would if a heavier single sheet of board were made. Although the plant was originally designed for a daily output of 450 tons, production has been increased to 525 tons. In addition, the laminated board bends without cracking and gives a higher Mullen test. 3 illustrations. E.S.

BOARD DRYING

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Board Committee.* The drying of paperboard; a report relating drying to production efficiency. 19 p. (1951).

The results obtained from 17 participating board mills in Canada and the United States to a paperboard-machine drying questionnaire are summarized and discussed; emphasis was placed on production rather than thermal efficiency. The questionnaire was prepared in such a manner that the answers would give a complete physical inventory of the board machine, including the moisture-vapor removal system and other pertinent factors in water-removal equipment on the wet end, and production and drying data. Inasmuch

as some of the mills used virgin pulp and others principally waste paper, the board was limited to two grades, patent coated and plain chipboard, with suggested calipers of 0.024 and 0.030 inch, respectively. 3 charts and 17 machine diagrams. E.S.

BOARD MILLS

ANON. New industry for Mexico; hardwoods are utilized to make hardboards. Pulp & Paper 26, no. 6: 35-6, 84 (June, 1952).

The new plant of Fibracel S.A. in the city of Valles, state of San Luis Potosi is described, which includes Asplund Defibrators, a Sandy Hill Fourdrinier machine, a hydraulic press, and a heat-treating chamber of Svenska Fläktfabriken. The plant has a daily output of 120,000-130,000 sq. ft. of hardboard. 5 illustrations of the plant and equipment. E.S.

LAWRENCE, J. F. Minas Basin Pulp & Power Company Ltd. at Hantsport, Nova Scotia. Pulp Paper Mag. Can. 53, no. 6: 98-104 (May, 1952).

The installations of Nova Scotia's only board mill with an annual output of 12,000 tons are described; a groundwood mill with an annual output of 28,000 tons (airdry) is included. The pulp is partly exported and partly used for the manufacture of molded pulp articles by the affiliated plant of Canadian Keyes Fibre Co. located across the road from the other mills. The furnish for the six-vat board machine consists of 80% waste paper and 20% groundwood and/or sulfite, as required. 2 flowsheets and 6 illustrations. E.S.

PULP & PAPER. New Oklahoma mill. Pulp & Paper 26, no. 6: 64-5 (June, 1952); *cf.* B.I.P.C. 22: 730.

A brief description of the new board mill near Pryor, Okla. of the National Gypsum Co. is given. 12 illustrations. E.S.

BOARD SPECIALTIES

MODERN PACKAGING. Tonic for sales. Modern Packaging 25, no. 10: 92-3 (June, 1952).

Canada Dry beverage company is employing a new four-bottle carrying case for its quinine water promotion. The carton is run off on five-color equipment and is die-cut to conform with the contours of the printed decoration. A gate lock keeps the case rigid and a scored finger opening offers a safe, easy grip. 5 illustrations. L.C.

BOARD TESTING—PHYSICAL

CHAPMAN, S. M. Correlation of the surface oil resistance of paperboard with the results of gloss ink printing. Pulp Paper Mag. Can. 53, no. 6: 135-6 (May, 1952); *cf.* B.I.P.C. 19: 534-5.

In a previous paper a reasonable agreement was determined between the surface oil resistance of paperboard as measured by the Board Committee test (*cf.* C.P.P.A. Technical Section. Standard Method F-5 [1950]) and the results of gloss-ink printing. Further work by the Board Committee suggested that there might be some uncertainty in this correlation if the material used in the coating of paperboard were changed; an investigation into this possibility is described in the present article. Five different boards were supplied by the Committee. They were all made of the same base stock on the same machine, one after another; the only change involved the use of the calender solution. The samples were tested and printed in the manner described in the

previous report. The samples did not encompass as wide a range of surface oil resistances as did the previous samples. The results obtained, however, agreed with those previously reported. All data fell on the previous curve within the statistical limits of error established by the original data. It is concluded that these changes in the coating material did not appreciably affect the accuracy of the test. This conclusion is necessarily confined to the materials used in the boards supplied but, in view of these results, it seems unlikely that other common coating solutions will seriously affect it. 2 tables, 1 figure, and 2 references. E.S.

HIGGINS, JAMES J. Routine tests for scoring and gloss ink printability. Tappi 35, no. 6: 132-3A (June, 1952).

The use of the score bending tester developed at the Ohio Boxboard Co. and the Vallandigham oil absorption meter for predicting the printability of gloss inks on board is outlined briefly. E.S.

HODDER, I. G., and MACKNEY, A. W. Some properties and processing variables of wallboard pulp produced in Bauer refiners from *Pinus radiata*. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 116-29; discussion: 130-1 (1951).

Drainage time, fiber classification and fiber-length index, and the relationships between them have been studied for a number of grades of mechanical pulp used for wallboard manufacture. Simple relationships exist between these properties, so that the measurement of any one gives a primary measurement of pulp properties. Fiber-length index is proportional to the logarithm of the drainage time, and drainage time is directly proportional to the fraction passing through a 150-mesh screen and inversely proportional to that retained by a 20-mesh screen. The solids content of the pressed mat is directly proportional to the logarithm of the dewatering pressure which is independent of the drainage time and the weight of the mat. The strength and density of finished board are influenced by both drainage time and dewatering pressure. The modulus of rupture of board prepared at a given dewatering pressure is proportional to the logarithm of the drainage time, and the higher the dewatering pressure, the greater is the strength level. The applications of these findings to wallboard manufacturing processes are discussed. 3 tables, 7 figures, and 2 references. E.S.

CALCULATING MACHINES

ANON. Champion Paper uses the IBM calculator. Paper Ind. 34, no. 3: 364-5 (June, 1952).

In a series of 10 illustrations, the use of the IBM electronic calculator in compiling the payroll by the Hamilton Division of the Champion Paper and Fibre Co. is described. E.S.

CELLULOSE

LEECH, JOHN G. Acetolysis products of slash pine alpha-cellulose studied by chromatographic methods. Tappi 35, no. 6: 249-53 (June, 1952).

Cotton cellulose and filter paper have frequently been subjected to acetolysis, but wood celluloses have seldom been studied by this reaction. In the work herein described, an α-cellulose prepared from slash pine (*Pinus caribaea*) was subjected to acetolysis, and the resultant sugar acetates were fractionated by adsorption chromatography. The crystalline substances isolated from the fractions were α-cellotriose hendecaacetate, α-cellobiose octaacetate,

β-cellobiose octaacetate, and α-D-glucopyranose pentaacetate. Studies of the mother liquors (by paper partition chromatography) indicated that a disaccharide of mannose may have been present in the α-cellotriose hendecaacetate fraction, and that a disaccharide of glucose and mannose was almost certainly present in the α-cellobiose octaacetate fraction. These results would indicate that some of the mannose units in slash pine α-cellulose are chemically linked to glucose units as well as to other mannose units. Most of the mannose units in the acetolyzate were found to be in either the monosaccharide acetates or cellodextrin acetates fractions. Chromatographic studies of the acetolyzate of ivory nut mannan "A" indicated the presence of a mannose disaccharide acetate; no crystalline acetates of mannose or mannose oligosaccharide acetates were isolated. Studies of the material (from the α-cellulose) insoluble in cuprammonium hydroxide and cupriethylenediamine revealed the presence of glucose units only. Studies with sodium periodate and periodic acid indicated that the sugar units (both glucose and mannose) in the slash pine α-cellulose are substantially all linked through positions 1 and 4. 4 tables, 3 figures, and 27 references. E.S.

CELLULOSE—HEMICELLULOSE

WETHERN, JAMES D. Some molecular properties of the hemicelluloses of black spruce. Tappi 35, no. 6: 267-71 (June, 1952).

Representative samples of hemicelluloses isolated from black spruce have been studied with respect to the molecular size and chemical homogeneity. Methods of preparing holocellulose were examined to determine their relative influence on the D.P. of the hemicelluloses. Based on viscosity measurements, the hemicelluloses isolated from a holocellulose prepared by a chlorine-ethanolamine procedure were found to be less degraded than those from holocelluloses prepared by the chlorite or chlorine dioxide-pyridine procedures. Therefore, hemicelluloses for further study were prepared by this method. The benzoate, benzoate-acetate, and butyrate esters of the hemicelluloses were substantially soluble in certain organic solvents. The butyrate was most suitable for molecular weight measurements, for it was formed with the least reduction of the D.P. and with the highest yield of chloroform-soluble products. The formation of films of these derivatives was also shown to be possible. The average molecular weight of the isolated hemicelluloses, determined by osmotic-pressure measurements on the derivatives, was approximately 20,000. This corresponds to a D.P. of 150 (calculated as a pentosan) or 120 (calculated as a hexosan). The chemical heterogeneity of the hemicelluloses was established by fractional precipitation from formamide solutions; the fractions isolated had pentosan contents ranging from 30 to 57%. Fractionation of the butyrate from acetone solutions yielded fractions which had D.P.'s ranging from 50 to 300. 6 tables, 3 figures, and 21 references. E.S.

CELLULOSE—ION EXCHANGE

ANT-WUORINEN, OLLI. The reactivity of the carboxyl groups of cellulose. Paper and Timber (Finland) 34, no. 5: 195-201 (May, 1952). [In English]

Cellulose samples were treated with dilute acid and then washed free of acid with carbon dioxide-free water or with distilled water in equilibrium with the carbon dioxide content of the atmosphere. The washed cellulose was then suspended in sodium chloride and the suspension titrated with dilute alkali. The titration values continued to decrease as the number of washings increased, eventually falling below the values established by washing with carbon dioxide-saturated, distilled water. The effect is greater with carbon

dioxide-free water. The authors interpret this as an indication that the carboxyl groups of the cellulose are gradually converted to salts by ion exchange with cations in the distilled water, even in that which is in equilibrium with the carbon dioxide of the atmosphere. 14 tables, 1 figure, and 6 references. K.W., Jr.

CELLULOSE—SORPTION

STANDING, H. A. The equilibrium absorption of direct dyes by cellulose materials. Chemistry & Industry no. 24: 527-30 (June 14, 1952).

The author reviews the principal experimental facts in the study of the equilibrium absorption of direct dyes by cellulose and discusses briefly the various theories which have been advanced. 3 figures and 8 references. E.S.

CELLULOSE ETHERS

LAURELL, LENNART. Retention of sodium carboxymethyl cellulose in wood-pulp. Svensk Papperstidn. 55, no. 10: 366-9 (May 31, 1952). [In English; German and Swedish summaries]

Simple filtration experiments are described in which the influence of different factors (freeness and concentration of the pulp, the degree of substitution of the CMC, the amount of alum added, and the most favorable time for this addition) on the retention of sodium carboxymethylcellulose (CMC) in paper was studied. The quantity of CMC retained by the pulp was calculated by subtraction of the amount determined in the filtrate. It was found that practically no retention takes place unless sufficient alum is added to precipitate the CMC; the optimum results are obtained when the alum is added before the CMC. The degree of substitution plays an important role; when the identical amount of alum is used, a considerably higher retention results with low-substituted CMC than with a conventional material. When these factors receive the necessary consideration, it should not be difficult to obtain an 80% retention of CMC in practical papermaking. 1 table, 6 diagrams, and 6 references. E.S.

CHEMICAL TESTING—BOARD

BRONIATOWSKI, ARNOLD. Quantitative determination of phosphorus pentoxide retained by impregnated wood fibers. Svensk Papperstidn. 55, no. 9: 313-15 (May 15, 1952). [In German; English and Swedish summaries]

The use of phosphates for flameproofing textiles has been known for a long time; recently they have also been applied for the same purpose to wood and pulps used in the manufacture of wallboard. Quantitative determinations of the phosphoric acid retained by wood fibers have been studied, and a gravimetric and a more rapid titrimetric method were developed. The gravimetric determination of phosphorus pentoxide by precipitation with ammonium molybdate following the ashing of the sample with magnesium acetate requires about five to six hours and gives values which are 2% lower than the theoretical yield. The titrimetric method involves dispersion of the fibers in water and titration of the divalent phosphoric acid from the first end point at pH 4.4 to the second end point at pH 9.6. The accuracy of the method is within ±2% of the theoretical yield; it can be recommended for routine control work. Details of both methods are given. 2 tables and 5 references. E.S.

CHEMICAL TESTING—PULP

BRYDE, Ø., and ELLEFSEN, Ø., Fiber fractionation and the chemical properties of the fractions. Tek. Ukeblad 98, no. 28: 552-8; no. 29: 568-75 (Aug. 9, 16, 1951). [In Norwegian; English summary]

Samples of various commercial pulps were fractionated in a Bauer-McNett classifier on no. 20, 35, 65, and 150 screens. Several chemical and physicochemical properties of the fractions were determined and plotted against the mode value of the weight-distribution curve of the fiber lengths for each fraction. The corresponding curves are presented; the observed properties are as follows: (1) resin content (alcoholic extract); (2) residual lignin, according to Løschbrandt (*cf.* B.I.P.C. 20: 906); (3) content of "A" and "B" cellulose (*cf.* Bryde and Smith, B.I.P.C. 21: 387-8); (4) the intrinsic viscosity of the nitrated material in acetone before subdivision in "A" and "B" fractions; and (5) the intrinsic viscosity of the "A" and "B" fractions. Five different pulp qualities were investigated: Kv. 1 and Kv. 5 were strong unbleached sulfite pulps, Kv. 4 an unbleached sulfate pulp, Kv. 3 a standard dissolving pulp, and Kv. 2 a high-alpha dissolving pulp. The fiber lengths were determined according to Brecht and Mory (*cf.* B.I.P.C. 5: 295), and the results are given for samples 3 and 4. The great spread of the frequency curves indicates that—at least in the long fiber fractions—all fiber lengths are present. Under such conditions it may appear dubious to plot curves where each fraction is represented by a single fiber length value, which in further operations is assumed to be representative for the entire fraction. As a matter of fact it can be shown that the shape of the curves may be equally well obtained when two components are assumed with different average properties mixed in proportions as given in one figure. Statistical evidence for the two-component hypothesis is presented. Some experiments were also carried out with beaten material; the pulps were treated in the P.F.I. laboratory beater to a beating degree of 45° S.-R. and fractionated. A study of the beaten fractions shows increasing amounts of the low-molecular "B" fraction in all fiber fractions, which indicates some degradation of the high-polymer molecules during beating. A corresponding change in viscosity could not always be found because of some disturbing effect. Since the increase in low-molecular material is observed in all fractions (in the longer fractions even more than in the shorter ones), it must be concluded that the molecular degradation takes place independently of the fiber-shortening effect. A chromatographic investigation of denitrated and hydrolyzed samples of "B" material, isolated from beaten and unbeaten fractions, indicates that the composition of the degraded material is very different from that of the total material, i.e., the attack is distinctly selective. 7 tables, 14 figures, and 22 references.

E.S.

O'BRIEN, A. S. Chemical Methods Committee. Tappi 35, no. 6: 105-7A (June, 1952).

With reference to the need for re-examination of the applicability of many of the older TAPPI procedures to very highly refined (dissolving) wood pulps or to cotton linters, the following methods are listed as requiring modification: pentosans, viscosity, α-cellulose, and permanganate number. The copper number, lignin content of pulp, and solubility in sodium hydroxide solutions of different strength are considered of questionable value, whereas the development of a test for chain-length distribution (D.P.) would be highly desirable.

E.S.

CHEMICAL TESTING—PULP—CAUSTIC SOLUBILITY

OHLSSON, KARL-ERIK. The alkali solubility of pulps. I. Method.

Svensk Papperstidn. 55, no. 10: 347-57 (May 31, 1952). [In English; German and Swedish summaries]

Following a brief review of the rather extensive literature on the subject (particularly of recent date), the author proves the dependence of the alkali solubility of cellulose on the ratio of caustic to pulp, the temperature and period employed, and the method of treatment and the nature of the sample. An improved procedure is described in detail which was developed on the basis of the Swedish standard CCA8 (*cf.* B.I.P.C. 15: 46-7) and the rapid photometric procedure by Barton and Prutton (*cf.* B.I.P.C. 15: 6-7). Following the oxidation of the dissolved material with dichromate and sulfuric acid, the dissolved carbohydrates are divided into beta and gamma fractions by neutralization with phosphoric acid and then determined by measuring in a spectrophotometer the absorption at 600 and 610 mμ, respectively, correcting for absorbency by subtraction of a blank determination, and calculating the amounts as milligrams of anhydroglucose from calibration curves prepared for glucose and xylose. The accuracy and reproducibility of the method are discussed. 6 tables, 10 figures, and 33 references. E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

TRIPP, VERNE W., CONRAD, CARL M., and MARES, TRINIDAD. Some relations between intrinsic and specific viscosity in cellulose solutions as a controlled velocity gradient. J. Phys. Chem. 56, no. 6: 693-6 (June, 1952).

Empirical equations relating the specific viscosity determined at a constant velocity gradient and at two convenient concentrations (0.25 and 0.50 g./dl.) with the intrinsic viscosity have been derived for solutions of cellulose in cuprammonium and cupriethylenediamine hydroxides. The relations are based on measurements on 14 celluloses of an intrinsic viscosity range of 20 or 30 to 0.2, the higher range variation depending on the solvent used. For each of the concentration levels studied, the identical equation holds for measurements in both solvents. The use of the relations requires the adjustment of the viscosity data to a mean velocity gradient of 500 $sec.^{-1}$ whenever the cellulose has an intrinsic viscosity greater than 5 or 6, the difference depending on the solvent used. The standard error of estimate of intrinsic viscosity by these equations is approximately 5%. 1 table, 3 figures, and 20 footnotes. E.S.

VOLLENBRUCK, HEINZ. The determination of the D.P. of cellulose fibers. Melliand Textilber. 33, no. 2: 153-6 (February, 1952). [In German; English, French, and Spanish summaries] *cf.* B.I.P.C. 21: 458.

A modification of the revised FaChemFa 2 method for the determination of the D.P. from the cuprammonium viscosity is presented, which extends the applicability of the method to high-polymer fibers, such as cotton and linen. In its present form, the procedure is intended as a control method of rayon, linen, and cotton degradation in laundry work. 4 tables, 2 figures, and 6 footnotes. E.S.

CHEMICALS

INDUSTRIAL AND ENGINEERING CHEMISTRY. Facts and figures for the chemical process industries. Ind. Eng. Chem. 44, no. 6: 1193-256 (June, 1952); *cf.* B.I.P.C. 20: 783.

The third biennial report consists of the following individual sections, listed by authors and titles: Crass, Maurice F., Jr. Record activity dimmed by taxes and controls, p. 1193-7; Tracy, O. V. Mobilization builds up productive capacity, p. 1198-202; Bohmfalk, John F., Jr., and Crowe, James M. Everything up but net income after taxes, p. 1203-08; Anon. 100 chemical process companies, an analysis of their financial records—1939, 1949, 1950, 1951, p. 1209-22; Merrill, Charles White. Shortages eased by expanding supplies, p. 1223-8; Barnett, Harold J. Energy resources—trends; future requirements, p. 1228-31; Pehrson, Elmer W. Foreign sources loom larger in U. S. supply, p. 1232-4; Stenerson, Harry. Production sights raised to meet demands, p. 1235-40; Hibben, J. H. Production and value achieve new highs, p. 1241-8; Knight, Harold A. Consumer demand expands and diversifies, p. 1249-52; and Markwood, L. N. Exports reach new high, imports up also, p. 1253-6. Tabular data and numerous charts are included in all articles. E.S.

CHLORINE DIOXIDE

KESTING, EDELBERT. The properties and manufacture of chlorine dioxide. Das Papier 6, no. 9/10: 155-61 (May, 1952). [In German] *cf.* B.I.P.C. 21: 229-30.

Following a brief description of the chemical reaction involved in the preparation of chlorine dioxide and sodium chlorite and the properties of the resulting products, the three commercial processes employed for the bleaching of chemical pulp are outlined: the Swedish Holst process (*cf.* B.I.P.C. 19: 388), the Swedish Persson-Angel process (*cf.* B.I.P.C. 20: 710), and the German Kesting or Munich process (German patent 831,542 [Feb. 14, 1952]). In the last-named process, solutions of sodium chlorate and hydrochloric acid are passed through a series of iron-jacketed stoneware reaction vessels arranged in a cascade. After the mixture of solutions has left the last vessel, it is allowed to flow into a reservoir and is then oxidized to the chlorate by electrolysis. A stream of air which is sucked through the apparatus serves to agitate the contents of each vessel and to entrain the resulting gas (chlorine and chlorine dioxide). The gaseous mixture is removed from the highest vessel and conducted to the bottom of an absorption column, where it is scrubbed with water. The chlorine dioxide is absorbed by the water, and the resultant solution (3-5 g. of chlorine dioxide per liter, equivalent to 8-13 g. of active chlorine per liter) is collected in a storage tank and thence pumped to the bleachery. Air and chlorine are removed from the top of the column and either passed to a limestone tower for conversion to hypochlorite or burned with hydrogen from the electrolysis to form hydrochloric acid, which is returned to the process. It is pointed out that an economic advantage results from the use of a mixture of chlorine dioxide and chlorine rather than pure chlorine dioxide. In general, the costs vary with local conditions, including electric power, size of the plant, and wages. Several plants using the Kesting process have already been built in Germany and others are under construction. 3 diagrams. E.G.S.

COLOR

OVERMEYER, ROBERT F. Color control in gravure printing. Tappi 35, no. 6: 133-4A (June, 1952).

The author lists the following factors necessary for good color control in gravure printing: control of all raw materials, thorough agitation of printing inks, use of uniform lighting for color matching, use of the same pigments at all times when matching a given color, reduction of variation in depth of etch in the printing cylinder, control of ink viscosity, and consideration of effects of overprinting or underprinting. E.S.

COLORIMETRY

BUC, G. L. Further tables for use in computing small color differences. Am. Dyestuff Reptr. 41, no. 12: 353-5 (June 9, 1952); *cf.* B.I.P.C. 21: 542-3.

A table for obtaining the square roots of the Munsell values $(0.23\Delta V_y)^2$, $\Delta(V_x-V_y)^2$, and $[0.4\Delta(V_z-V_y)]^2$ and for taking the final square root (sum of these three terms) has been prepared; its use is explained by an example. 1 table and 5 references. E.S.

DAVIDSON, H. R. Prediction of the color of dye mixtures on textiles. J. Optical Soc. Am. 42, no. 5: 331-2 (May, 1952).

The relationship between the ratio K/S and reflectance as derived by Kubelka and Munk has frequently been used for analytical work, but little attempt has been made to evaluate the accuracy of its application in colorimetric terms This evaluation has now been made for dyeings by comparing the predicted color with that actually obtained in textile dyeings, and the difference has been expressed in terms of Munsell notation. In this manner the accuracy of the method has been examined for acid, chromed, and metalized dyestuffs on wool, for acetate dyes, and for direct and vat dyes on cotton. The accuracy of color prediction for acid dyestuffs on wool has been found to average ±0.5 hue step, ±0.1 value step, and ±0.4 chroma step. Predictions for the other applications are nearly as accurate except in those cases where interaction of dyestuff molecules occurs. 1 table, 2 figures, and 3 references. E.S.

HEINDEL, DENNIS. The Densichron and other instruments used in color control. Tappi 35, no. 6: 131-2A (June, 1952).

Following a brief discussion of the Hunter color and color difference meter, the Photovolt brightness tester, and the General Electric recording spectrophotometer, the author describes the arrangement and operation of the color booth and the Welch Densichron used for the maintenance of color and color-control work. E.S.

TYLER, JOHN E. The dilemma of color control. Interchem. Rev. 11, no. 1: 3-12 (Spring, 1952).

The author discusses the differences between spectrophotometers and colorimeters, the advantages and disadvantages of each type of instrument, and the information which each yields. 2 tables and 6 figures. E.S.

CORROSION

GOW, JAMES T. What is corrosion? Pulp & Paper 26, no. 6: 78, 80 (June, 1952).

The author discusses the different types of corrosion (uniform, intergranular, pitting, galvanic, contact, stress, and erosion-corrosion) and methods of avoiding them. 6 figures. E.S.

COST—ACCOUNTING

TICE, HARRY, and CLAYTON, HARRY B. Incomplete cost data puts products in the red. Am. Paper Converter 26, no. 6: 12-13 (June, 1952).

The majority of paper converters unknowingly sell certain of their products either at no profit or at a loss because of inaccurate and incomplete cost

information. Computing total cost from material cost plus converting cost, or from labor cost plus burden as a percentage of labor are two common practices which conceal too many variable factors. The authors recommend a standard cost by product and by operation system and describe its five requirements. Variations of actual from standard cost are indications of manufacturing-procedure breakdown. Such a standard system allows errors in pricing to be quickly rectified and at all times presents a clear picture of sales profitability. L.C.

DIE-CUTTING

GUT, H. Steel-rule die-cutting in boxmaking. Allg. Papier-Rundschau no. 10: 455-6, 458-9 (May 26, 1952). [In German]

Useful directions for the preparation, application, and upkeep of steel-rule dies in the manufacture of folding boxes are given. 14 illustrations. E.S.

DRYING

MEYERCORD COMPANY, *Chicago.* Quicker way to dry coatings. Chem. Eng. 59, no. 6: 249-50 (June, 1952).

A new technique, the Chem-Dry process, dries or hardens coatings by an entirely new method, i.e., a chemical reaction, which involves the use of sulfur dichloride vapors which are blasted or sprayed over the coated materials. It takes only a few seconds to harden inks, paints, and varnishes, whether they are coated on paper, cloth, metal, wood, glass, or plastics. The equipment is simple and compact and requires little space. Chem-Dry is not suitable for processes which require humidity control within the equipment to obtain exact register for many coatings, as in the manufacture of decalcomanias, although the project was actually started with this use in mind. Some of its many other possibilities are listed. 2 figures. E.S.

DYES AND DYEING

MCGINN, E. P. How a dyestuff manufacturer serves the paper industry. Paper Trade J. 134, no. 24: 25-32 (June 13, 1952).

The contributions of a dyestuff producer to the paper industry are typified by the General Dyestuff Corp., an affiliate of General Aniline and Film Corp. One of its divisions, General Aniline Works (GAW), manufactures a complete line of synthetic colors including the water soluble, direct, basic, and acid dyes, pigments, color lakes, and vat dyes, as well as fluorescent colors and fluorescent whiteners. Layouts of three branch plants and representative dye-development processes are described, with mention made of other areas of research, such as in acetylene products, carbonyl iron powders, and synthetic detergents. Facilities are maintained for making handsheet dyeings of paper, for work in spectrophotometry and color measurement, and for color matching of samples sent in from various paper mills. The matching process is related in detail. 26 illustrations. L.C.

EDUCATION

STÅHLBERG, KAARLO. Impressions from a visit to America in 1950. Paper and Timber (Finland) 34, no. 4a: 151-6 (Special issue, April, 1952). [In Finnish; English summary]

The purpose of the trip was a study of the methods of technical education in American universities, particularly the teaching of chemical engineering.

Different phases of American methods are discussed, and the present trend to more fundamental studies is pointed out. Certain developments of interest to pulp and paper engineers are mentioned. E.S.

WRIGHT, C. C. Leisure time classes in camps. Pulp Paper Mag. Can. 53, no. 6: 151-2 (May, 1952).

The author describes basic English, Canadian citizenship, arithmetic, and leathercraft instruction given to European immigrants who are employed in Canadian lumber camps. The courses are sponsored by the company concerned and the Ontario Department of Education. L.C.

ELECTRIC PRECIPITATORS

BLESSING, W. H., and TRIPP, D. A. Electrostatic precipitators play important role in recovery of paper chemicals. Paper Trade J. 134, no. 25: 21-2 (June 20, 1952).

Until recently in most electrical-precipitator installations the dust has been collected in hoppers at the bottom and thence fed by screw conveyors to black liquor tanks to be returned to the system. In a new development, the hoppers are eliminated and replaced by a so-called wet bottom, which acts as a sump or tank through which the black liquor flows and takes up directly the dust rapped from the electrodes. Motor-driven rotary agitators are provided to circulate the liquor and facilitate solution or suspension of the dust in the liquor. The process is continuous; the black liquor from the multiple-effect evaporators enters at the bottom of the precipitator, takes up the dust, and discharges through a drain to pumps which convey it to the disk evaporators. A wet-bottom installation has recently been completed at Potlatch Forests, Inc. 3 illustrations. E.S.

EUCALYPTUS

COHEN, W. E., and MACKNEY, A. W. Influence of wood extractives on soda and sulphate pulping. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 315-35; discussion: 336 (1951).

This paper deals with some highly significant correlations represented by regression equations of the type $Y = ax + b$ and $Y = ax_1 + bx_2 + c$, between specified chemical properties of the woods of certain eucalypts and of pulps prepared from them under arbitrarily fixed conditions. In the first phase of the work, involving sulfate pulping, the wood properties examined were hot-water solubles and the consumption of sodium hydroxide. From the practical point of view the latter was more interesting because of the comparative speed at which it could be determined. The principal pulp properties were lignin content and permanganate number. The various correlations, together with their coefficients, are tabulated. From the theoretical point of view these regressions are interesting because they enable the prediction of the lignin content or the permanganate number of a sulfate pulp from certain chemical characteristics of the wood, provided that the wood is pulped under certain specified conditions. For practical purposes the results to this stage were inadequate for determining, from known chemical characteristics of a wood, the alkali requirements for sulfate pulping to a specified lignin content or permanganate number. Furthermore, it was desired to determine whether the relationships would hold for soda pulping. Therefore, additional wood samples were treated by the soda process to give data from which were calculated multiple correlations of the type $Y = ax_1 + bx_2 + c$. The application of these results in soda pulping is illustrated by means of charts from which active alkali requirements for producing a pulp which has a given permanganate num-

ber or a given lignin content may be predicted, provided that either the hot-water solubles of the wood or its alkali consumption (empirically determined) is known. The prediction charts have already been useful in the laboratory, but their adaptation to mill control depends on the existence of reliable methods for accurate sampling of large quantities of chips and availability of tannin- and acid-resistant equipment for rapid comminution of green eucalypt chips. A suitably constructed Wiley mill is recommended for the latter purpose. In addition to the relationships found between the properties of wood and of the pulps derived from them, a correlation between lignin content and permanganate number of soda pulp was found to be significant at the 0.1% level. 3 tables, 4 figures, and 9 references. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

SCHOLANDER, AXEL. Problems connected with the evaporation of spent sulfite liquor. Paper and Timber (Finland) 34, no. 4a: 140-51 (Special issue, April, 1952). [In Swedish; English summary]

The present status of evaporation of spent sulfite liquor in Sweden and future trends and developments are reviewed. Problems connected with the evaporation and burning of the spent liquor are discussed, including the recovery of the liquor, difficulties caused by the ash in the boiler and the surroundings of the plant, flue-gas problems, the risk of sulfur dioxide damage caused to vegetation, the elimination of the sulfur dioxide by a scrubbing process, and water-pollution problems caused by the solubility of the ash and sludge from the scrubber; possible applications of the ash are listed. 4 tables, 7 figures, and 27 references. E.S.

FIBER—STRUCTURE

WARDROP, A. B., and DADSWELL, H. E. Cell wall studies in relation to pulp and paper research. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 204-22; discussion: 223-5 (1951).

The fundamental wall structure of the various constituent cells of wood is reviewed, and new information is presented on the micellar spiral organization in medullary ray and vertical parenchyma cells. In these cells the micellar spiral angle is shown to be 40 to 50°. The relation between wall structure and fiber properties is discussed, and some new techniques for examining fiber surfaces are described. The importance in pulp and paper research of the changes to the fiber surface before and during bonding is stressed. 1 table, 18 figures, and 49 references. E.S.

FINISHING ROOM

CORNELIUS, J. A discussion of paper finishing operations. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 49-63; discussion: 64-6 (1951).

The general equipment and arrangement for reeling, cutting, sorting, and ream wrapping of fine paper at the Burnie mill of Associated Pulp and Paper Mills Ltd. are described, and possible lines of development are discussed. Emphasis is laid on the high labor cost involved in these operations and the need for the elimination of faults which arise earlier in manufacture to minimize sorting costs. E.S.

ESMANN, PER. Time studies in the finishing room. Paper and Timber (Finland) 34, no. 5: 205-7 (May, 1952). [In Norwegian; English summary]

The improvements resulting from detailed time and motion studies in the finishing room (paper sorting by girls) of a Norwegian mill outside Oslo are described; the mill became able to compete successfully with the higher wages and easier jobs offered by the nearby town. 4 tables and 1 diagram. E.S.

FIRE PREVENTION

SUTER, TH. Suggestions for fire prevention in the textile and paper industries. Textil-Rundschau 7, no. 5: 222-9 (May, 1952). [In German]

The author discusses precautions in the construction of mills (particularly the need for fireproof subdivisions of large plants under one general roof), boilerhouse and other thermal equipment, electrical installations, illumination, storage of raw materials, the operation of machinery (with emphasis on the drier part of the paper machine with its ventilation equipment), general good housekeeping, and suitable fire-extinguishing equipment of adequate size. A graph depicting the frequency of fires on different weekdays in Switzerland for the period from 1937 to 1946 is included. 4 figures. E.S.

FLAX

LÜDTKE, MAX. Studies on the chemical processes which occur when flax stalks are pulped with water. Melliand Textilber. 33, no. 2: 107-11 (February, 1952). [In German; English, French, and Spanish summaries]

Flax stalks, fiber (I) or chaff (II), both retted and unretted were subjected to steam treatment at atmospheric pressure. The issuing steam was then condensed, together with any aqueous extracts, and their components examined chemically. The fibrous residues were also investigated. Losses were noted, as well as total, evaporated extractives, and compared with the over-all losses caused by retting. In general, the percentage loss by steam treatment was roughly the same (about 25%) as that obtained by double retting. Single retting, however, gave much lower losses. The steam extractives often showed remarkably high reducing values, especially when hydroiodite titrations were used, and similarly high values were obtained when spruce- and beechwood shavings were steamed. The reducing values of the original (I) and (II) and those of the fibrous residues after retting or steaming were relatively low. The high hydroiodite reducing values are ascribed to the presence of sugars or their derivatives obtained largely from polyoses. Whereas the original uronic acid content varied from 3 to 6%, steam extraction lowered this to 1-2.4% in the fibrous residues. Furfural-yielding materials in the steam extracts were relatively high, and the fibrous residues after steaming in the case of (II) were lower than those in the untreated (II). This was not the case for (I). The steam distillates from both retted and unretted (II) gave far higher acetic acid values than did those from (I). The steam treatment, although not qualitatively comparable to double retting, yields a fiber which does not give trouble in subsequent spinning. 9 tables and 20 footnotes. L.E.W.

FLUID DYNAMICS

HEAD, VICTOR P. A shear criterion for the hydraulic behavior of paper stocks in pumps, pipes, valves, and flowmeters. Tappi 35, no. 6: 260-6 (June, 1952).

The apparent viscosity of a non-Newtonian fluid is not a fluid property, nor does it have meaningful physical dimensions in mass-length-time in the absence of completely defined flow geometry. The slope and intercept of the

shear diagram are truly fluid properties which remain constant over wide ranges of shear rate and which have the physical dimensions of viscosity and of stress, respectively. The terms slope viscosity and apparent yield stress are proposed as descriptive of these properties. The definition of viscosity might well be altered to mean the slope of the shear diagram, whereas the difference between true and non-Newtonian fluids would be expressed merely by the value of the apparent yield stress which is, of course, zero for Newtonian fluids. Slope viscosity assumes a negligible role, and yield stress in shear a dominant role in the flow of paper stock in pipes, pumps, valves, and flowmeters. A shear criterion has permitted very precise correlation of the flow coefficients of variable-area flowmeters in stock service, and a fiber-length criterion has shown the limits of validity of the shear criterion. Promise of equal success in the case of pipe friction appears evident, and it is hoped that the yield-stress concept will prove useful in many other phases of paper engineering. 7 figures and 2 references. E.S.

FOREST FIRES

HESS, Q. F. Fighting forest fires with water bombs. Pulp Paper Mag. Can. 53, no. 6: 146-8 (May, 1952).

The objective in forest-fire control, other than prevention, is the fast discovery and fast application of control measures. If ground crews are unable to reach an ignited area within specified travel-time standards, the fire has a better chance to spread to a size difficult or impossible to control. The slowing down of such a forest fire until ground crews can reach it is necessary if protection standards are to be met. Experiments indicate that a technique of water bombing as described in this paper can retard forest fires considerably and, in some cases, check them completely. 2 illustrations. L.C.

FORESTS AND FORESTRY

ANON. Project receives timber grant. Can. Pulp Paper Ind. 5, no. 6: 24, 26 (June, 1952); *cf.* B.I.P.C. 22: 510.

A forest management license to Celgar Development Co. Ltd. has been approved by the government of British Columbia; it covers an area stretching northward from Castlegar through the Arrow Lakes region to the most northern point of the Big Bend highway. Approval of Celgar's application, however, does not mean that the license has been granted. Before this is done, the company must submit for approval a working plan to show how it proposes to manage the area subject to controls as provided by the Forest Act and such safeguards as may be necessary in the public interest. 1 map. E.S.

NEFF, L. P. A comprehensive cutting study in swamp black spruce. Pulp Paper Mag. Can. 53, no. 6: 167, 170, 172 (May, 1952).

An experimental forest of black spruce at Big Falls in Koochiching County is being studied by the Minnesota Forest Service to determine the best silvicultural methods to meet the increasing scarcity of this severely overcut species. One hundred sixty acres of pulpwood stands are subjected to various cutting systems and the results studied under controlled conditions. 2 illustrations. L.C.

FURFURAL

REINECK, EDWARD A. Furfural as a resin former. Modern Plastics 29, no. 10: 122, 124, 195-6, 199-200 (June, 1952).

By far the largest quantity of furfural used in resin manufacture is consumed by the phenolic-resin industry where it is employed for modifying

purposes, often in combination with formaldehyde. Lesser quantities are employed in specialty resins, such as acid-catalyzed furfural, furfural ketones, and furfural aniline. Applications of furfural resins are discussed under molding compounds (including bagasse molding compounds), varnishes and lacquers, carbon and graphite construction materials (such as Karbate), hydrophobic aggregates for road building, and furfural-phenol reaction products. 1 table and 5 footnotes. E.S.

GROUNDWOOD PULP

DADSWELL, H. E. The influence of wood structure on the quality of eucalypt groundwood. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 170-87; discussion 201-3 (1951).

Two groundwood pulps from *Eucalyptus regnans* F.v.M., one of which was of lower strength than the other, various fractions from these pulps, and wood samples cut from the billets from which they were made, have been examined. More whole fibers and less fibrillar debris were observed in the stronger pulp, and the average length of whole fibers retained on the coarsest screen was greater. It was concluded from the examination of fiber cross sections that the fibers from the stronger pulp were somewhat less damaged and had fewer breaks across the cell wall. The wood which produced the better pulp was derived from sound billets of large trees approximately 370 years old; the average basic density was 33 lb./cu. ft., and the narrow growth rings averaged 13 per inch. The wood which yielded the other pulp was derived from young regrowth trees of pole size 12 to 18 in. diameter at breast height and averaged six growth rings per inch; the basic density was 30 lb./cu. ft. There was a greater proportion of thicker-walled fibers in the denser, slower-grown material, and the average fiber length was greater than in the faster-grown, young material. The variations observed in radial growth rate, fiber dimensions, cell-wall thickness, and density led to the assumption that in this species good-quality groundwood pulp is correlated with long fibers and thick cell walls. The examination of wood surfaces which had been in contact with the stone showed that, when these were strictly tangential or radial, rupture during grinding occurred principally in the intercellular zone; the fibers were "rolled off" the wood. On the other hand, when the surface was at an angle to the rays of growth rings, the rupture occurred more commonly through the cell walls, thus producing more fibrillar debris. The thinner the cell wall the greater was the extent of cell-wall damage observed. 18 figures and 9 references. E.S.

HOLTE, T. Damage of unbarked, floated wood, with particular reference to its use in the manufacture of groundwood pulp. Norsk Skogind. 6, no. 5: 126-33 (May, 1952). [In Norwegian; English summary]

When unbarked or partially barked sprucewood is floated or stored in water, an outer sapwood layer is frequently formed which resists sulfite pulping. According to Sundstedt (*cf.* B.I.P.C. 6: 157) this layer gives a distinct violet color reaction when moistened with a solution of one part of concentrated sulfuric acid in four parts of methanol (I). The extent of this damage corresponds closely to the temperature of the water and the period of soaking. Grinding experiments were made in a Norwegian mill with three different wood samples: A—highly damaged logs which had been in water for three years; B—sound logs; and C—slightly affected logs. The cut surfaces of the logs were treated with (I) and showed distinct color reaction in the affected layers. A photograph of the cut surfaces was measured planimetrically and showed that approximately 20% of the wood volume was damaged. Cook-

ing experiments were also made with sound and damaged wood; the high yield of screenings obtained with A confirmed that this sample had been seriously damaged. The dimensions and physical properties of the logs were determined and treated statistically; A and C showed good agreement, whereas B showed variations. The strength properties, PFI brightness, and reflectance for the visible range of the spectrum were determined on all three groundwood samples; no significant difference between damaged and sound wood could be detected. The influence of ultraviolet light and storage on the pulps was also investigated. The pulp from affected wood was not found to yellow any faster than pulp from sound wood. 1 table, 9 figures, and 2 references.
E.S.

SOMERVILLE, J. L., and BURKITT, J. S. Physical aggregation of eucalypt groundwood. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 146-69; discussion 201-3 (1951).

The wood used at the Boyer mill for the manufacture of groundwood is chiefly *Eucalyptus regnans*. The strength of the groundwood varies greatly within the species, both within the tree and between trees from different forest sites and of different ages. The average strength is, however, high enough to make satisfactorily strong newsprint when used along with 20 to 23% of coniferous sulfite pulp, and a small proportion, as well, of weak groundwoods made from the subsidiary species *E. gigantea* and *E. obliqua*. The running quality on the paper machine of the mixture allows speeds of 1050 to 1260 ft./min. on a machine designed for 1200 ft./min. The strongest groundwood from *E. regnans* is obtained from near the center of most old trees (150 to 500 yr.); it is sound, mellow (soft and with pliable splinters), cream-colored wood and develops a pink tint on exposure to air; it yields pulps at 100 Canadian Standard freeness which have burst factors of 12 to 30 and tear factors of 25 to 50. Wood lying in the same position in regrowth trees of 12 to 25 years of age from the same areas gives much weaker groundwood; the wood is white, short in the grain, and gives no pink coloration on exposure. This change in nature and grinding quality occurs naturally during the growth of the tree. Wood samples of *E. regnans* of the mellow type and of 23-year-old regrowth trees were ground in the mill grinders and yielded strong and weak groundwoods, respectively. The tensile strength of a series of screen fractions of the two types showed a constant difference in favor of the strong pulp, which also had more long fibers. Remaking groundwoods at selected compositions demonstrated that the high strength of the fractions was one cause which contributed to the high strength of the pulp from the mellow wood, and the other cause was the high proportion of long fiber. It also showed that weak pulp was redundant in fines. The water retention numbers of fractions from a different pair of weak and strong groundwoods were higher for the strong pulp than for the corresponding fractions of the weak pulp; of the sawdusts from the woods yielding these pulps, that from the wood which gave the strong pulp had the higher water-retention number. The bearing of these results on those of the two other papers in this symposium (*cf.* preceding and following abstracts) and on the nature of the change from young to mellow wood is discussed, with the suggestion that the lignocellulose of the secondary wall is more swollen in the latter; this causes the greater strength of each fraction of the pulp from this wood. 5 tables, 5 figures, and 34 references.
E.S.

WATSON, A. J., and COHEN, W. E. Chemical composition of eucalypt groundwood. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 188-200; discussion 201-3 (1951).

Good-grinding wood of *E. regnans* F.v.M. has been shown to differ from poor-grinding wood in giving a substantially lower yield of chlorine holo-

cellulose resulting from loss of nonresistant carbohydrate material. Its lignin had been modified, and the pH of its aqueous extract was lower than that of the poor-grinding wood. The changes in the nonresistant carbohydrate fraction and in the lignin were similar to those produced by very mild hydrolytic treatments. They probably occurred in the middle-lamella zone and, consequently, could influence the ease with which fibers are separated from the wood during grinding. It is suggested that the old trees produced the high-grade groundwood because the acidic conditions prevailing over 200 years or more influenced the chemical composition and, hence, the grinding characteristics. There was some modification of the nonresistant carbohydrate material during the production of groundwood from both the good- and poor-grinding wood. This has been attributed to the rupture of the middle lamella and immediately adjacent zones during grinding, thereby exposing relatively nonresistant material to the reagents used in the holocellulose determination. 4 tables, 1 figure, and 9 references. E.S.

ILLUMINATION

KAHLER, W. H., and WERNER, W. P. Better paper through engineered lighting. Paper Ind. 34, no. 3: 366 (June, 1952).

The shadowfree illumination developed for the paper-machine and roll-storage room at the Rittman mill of Ohio Boxboard Co. is described briefly. 3 illustrations. E.S.

INSTRUMENTATION

CHERMAK, RAYMOND M., and GEARHART, DAVID B. Supervisor's instruments. Pulp & Paper 26, no. 6: 72-3 (June, 1952).

General Electric recording instruments installed in the offices of supervisors of the Kalamazoo Vegetable Parchment Co. provide them with continuous, up-to-the-minute records of paper machine performance and eliminate routine trips to various parts of the mill. Supervisors can also quickly acquaint themselves with the performance of the previous night, and arguments about past productions can be cut short. Details of the installation are given. 3 figures. E.S.

PARAGON, R. Control and automatic regulation in the paper industry. Bull. assoc. tech. ind. papetière 6, no. 2: 44-62 (May, 1952). [In French]

The author reviews the many possibilities for automatic controls in the pulp and paper industry, including applications in the steam plant, preparation of raw materials, cooking process, paper-machine operation, and recovery of spent liquors and white water. 10 figures. E.S.

INSULATION AND INSULATING MATERIALS

THE MAGNESIA INSULATION MANUFACTURERS ASSOCIATION. Special techniques used in insulating spherical digesters that rotate. Chem. Processing 15, no. 6: 60-1 (June, 1952).

The special methods for applying 85% magnesia insulation to the rotary furfural digesters of the Quaker Oats Co., Omaha, Neb. are described. The 1.5-inch thick magnesia blocks were secured to the shell with sodium silicate adhesive, and wire was run between stud bolts previously welded to the surface of the digester shell; joints were sealed with asbestos cement. A hexagonal wire mesh was tightly stretched over the insulation and wired to the bolts and cross wires. A 0.5-inch layer of asbestos cement was then applied,

coated with sodium silicate adhesive, and covered with asbestos cloth. Reference is also made to the relatively simple application methods for other equipment and steam piping. 3 illustrations. E.S.

LIGNIN

FREUDENBERG, KARL, REZNIK, HANS, BOESENBERG, HEINZ, and RASENACK, DIETRICH. The enzyme system which is involved in lignification. Chem. Ber. 85, no. 6: 641-7 (June, 1952). [In German]

An enzyme which appears to play a role in lignification is the highly localized β-glucosidase which is found very close to or within the cambial zone, but outside of the range of lignified wood in living sections of young *Araucaria excelsa* shoots. The presence of this enzyme is shown by means of indican, which is cleaved to indoxyl and oxidized to indigo blue. Redoxases (i.e., dehydrogenating or oxidizing enzymes) in the cambial zone can function as does fungal dehydrogenase. They produce ligninlike substances from coniferyl alcohol. These findings lead to an extension of the lignification hypothesis. Presumably the glucosidase splits coniferin and yields coniferyl alcohol, which may then be converted enzymatically into lignin. By means of schematic sketches, the authors indicate how this process may occur during growth; a somewhat improved synthesis for indican is given (*cf.* Robertson, J. Chem. Soc.: 1937-43 [1927]). They also describe the preparation of redoxases remaining insoluble in the plant tissues, i.e., pyrocatechol oxidase and peroxidase. When coniferyl alcohol is added to buffered, pulverized, extracted tissues, and the mixture aerated and treated (at about pH 5.5) with hydrogen peroxide, small amounts of ligninlike substances are isolated by extracting the centrifugate with acetone, filtering, and then precipitating with water. One of these preparations contained 66.7% carbon, 6.3% hydrogen, and 16.7% methoxyl, and was very similar to a substance prepared with a fungal enzyme. Another preparation contained 64.5% carbon, 6.1% hydrogen, and 17.3% methoxyl. When the enzymatic action was discontinued prematurely, small amounts of crystalline dehydrodiconiferyl alcohol were formed. 2 tables and 14 references. L.E.W.

HÄGGLUND, ERIK, and RICHTZENHAIN, HERMANN. Comparative investigations on native and isolated lignin. Tappi 35, no. 6: 281-4 (June, 1952).

To characterize any possible differences between the isolated and the native lignin in wood, the alcoholysis and the sulfonation of wood have been compared with that of a carefully prepared hydrochloric acid lignin. The influence of methylation on the course of these reactions was also studied. 2 tables and 3 figures. E.S.

MEREWETHER, J. W. T. The existence of a lignin-carbohydrate bond and the isolation of lignin. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 226-62; discussion: 263-6 (1951).

A critical review is given of the literature relating to evidence for and against the existence of a chemical linkage between lignin and carbohydrate, together with a summary of the methods used for the isolation of lignin. 3 tables and 306 references. E.S.

PEW, JOHN C. Structural aspects of the color reaction of lignin with strong acid. J. Am. Chem. Soc. 74, no. 11: 2850-6 (June 5, 1952).

The well-known green color produced by the action of strong acids on sprucewood was examined spectroscopically and found to be composed of a yellow and a blue component. The yellow color, which develops first, resembles that given by substituted cinnamaldehydes with the acid reagent. Among several of such aldehydes investigated, only 5-propenylconiferylaldehyde gave a yellow color with an absorption maximum at a wavelength identical with that of the sprucewood. The blue color appears to be the result of a phenol-aldehyde condensation between the substituted-coniferylaldehyde group and a phenylpropane unit in the lignin structure, a position ortho to the side chain being attacked. Two model compounds of this type were synthesized, the blue colors of which resembled that produced in wood. The "hidden maximum" in the ultraviolet absorption spectra of untreated wood sections was resolved by using, as a reference material, a section which had been bleached with sodium peroxide. The resulting curve has a maximum absorption nearly identical with that of coniferylaldehyde substituted in the 5-position with a carbon side chain. The bleaching of spruce groundwood would appear to be due, in part at least, to the destruction of this grouping. 1 table, 6 figures, and 18 footnotes. E.S.

MACHINERY

ANON. AB C. J. Wennbergs Mekaniska Verkstad; a family enterprise of Värmland. Svensk Papperstidn. 55, no. 10: 370-2 (May 31, 1952). [In Swedish]

A history of "Weverk" and its three generations of owners is given; a large percentage of its output of machinery serves the pulp and paper industry. The most recent development is a portable barking machine which can be moved into the forest to the site of the logging operations. 3 illustrations. E.S.

ANON. A new pulp system; equipment "firsts" in Virginia. Pulp & Paper 26, no. 5: 55, 57-8 (May, 1952).

The automatic wet-end control system of the sulfate pulp drying machine at the West Point, Va. plant of The Chesapeake Corp. is described, including the individual controls of the Vibrotor screens, the Kamyr wet machine, the stock from the Hydrapulper (which goes either to the tailings tank or back to the stock chest), and the new Ross continuous, convected-air pulp drier. All operations are observed and controlled from a master Westinghouse panel. 1 flowsheet and 10 illustrations. E.S.

MACHINERY——BEATERS

READ, W. D., CLIVE, E. R., and JAMES, R. P. The Morden Stockmaker—its use in the preparation of chemical pulp in newsprint manufacture. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 92-110; discussion: 111-15 (1951).

A preliminary examination of the performance of Morden Stockmakers for the treatment of the chemical pulp component of the newsprint furnish has been made. Series operation of the Stockmakers was adopted when a sufficient number of them were installed, and the reason for this procedure is outlined. General characteristics of the Stockmakers in relation to output, power input, and strength development for both unbleached sulfite and semi-bleached kraft are recorded and discussed. Attention is called to the behavior with regard to strength development of, and the performance of the Stockmakers on, the two types of pulp, and to the adaptability of the units in the treatment of these pulps. The present comparison of the Stockmakers with

the hollanders previously used for stock treatment is narrow in scope, and the suitability of the Stockmakers is judged largely by their individual performance. The range covered as test units was limited by the fact that on installation the Stockmakers were immediately run as production units. 13 tables and 4 figures. E.S.

MACHINERY—BOARD MACHINES

TOL'SKIĬ, G. A. Profound investigation of the operation of cylinder board machines. Bumazh. Prom. 25, no. 1: 15-19 (January-February, 1950). [In Russian]

Various flow systems for cylinder-machine vats are described. 1 table and 8 figures. E.G.S.

MACHINERY—CABLES

MORTENSON, A. O. Electric cable investigation report. Tappi 35, no. 6: 136-61A (June, 1952); *cf.* B.I.P.C. 22: 669.

Data on the types of cables preferred for different applications in the pulp and paper industry are presented in tabular form; they were secured through questionnaires sent out by the TAPPI Cable Subcommittee. E.S.

MACHINERY—CONVERTING MACHINERY

TRESEDER, A. R. Converting trends and their significance to the papermaker. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 79-89; discussion: 90-1 (1951).

Examples of improvements in converting machinery (carton machine, rotary wrapper printer, and bag machine) are quoted to show the need for greater uniformity in the properties of paper and board. A graphical method of quality control is suggested as a means of achieving greater uniformity; the need for periodic operating surveys and tests of field performance is emphasized. 2 figures. E.S.

MACHINERY—CUTTERS

ANON. New design cutter and layboy. Pulp & Paper 26, no. 6: 63 (June, 1952).

A brief illustrated description of the new Moore and White heavy-duty, duplex, rotary sheet cutter and duplex layboy is given, which were recently installed in the Camas mill of Crown Zellerbach. 5 illustrations. E.S.

MACHINERY—DOCTORS

NISSAN, A. H., and UNDERWOOD, N. C. Cause and prevention of scoring of doctored machine calender rolls. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 2: 37-9 (April, 1952).

Deep scores were observed to be forming at a relatively fast rate on chilled iron machine calendar rolls of a high-speed newsprint machine; the rolls were doctored by steel blades. The cause was found to be a local hardening of the edge of the steel blades which resulted from intense local heating, followed by rapid cooling when a piece of grit or similar material became lodged under the blade. It appeared that phosphorus-bronze blades would not show this behavior, and a mill trial confirmed that they produced no scoring of this type on the calender rolls. A novel method of measuring the hardness of the edge of the blades is described. 2 figures and 1 reference. E.S.

MACHINERY—DRYERS

CHAPMAN, J. High velocity air drying on Yankee machines. Svensk Papperstidn. 55, no. 9: 321-6 (May 15, 1952). [In English] *cf.* B.I.P.C. 20: 873; 22: 670.

The principles of the Spooner equipment for M.G. hood drying and recent improvements in its design are described; a comparison with other equipment used in the field is made. 12 figures and 6 references. E.S.

LANIGAN, JOHN J. The ideal drier system. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 26-43; discussion: 44-8 (1951).

The drying of paper by steam-heated cylinders is examined, and some of the factors which affect drying are stated. The choice of steam conditions is discussed in detail. Particular attention is devoted to the importance of condensate removal and air venting, and various systems of condensate removal are described. Theoretical requirements for the ideal drier system are established and after four actual systems are examined, including the British V.J.B. system and the Holmes & Kingcome system, the author presents a design for the ideal drier system. 3 tables, 8 figures, and 3 references. E.S.

SPALDING, C. P. High pressure paper dryers. Tappi 35, no. 6: 258-9 (June, 1952).

There is a mounting interest in increasing the drying capacity of high-pressure driers. On a new machine it is sometimes better to design for low operating steam pressure, but to install high-pressure driers for future expansion. On a rebuilt machine these should be used if the sheet can be dried at high temperature. This question should always be studied with care. Both Yankee and paper driers can be furnished for pressures up to 160 p.s.i. in cast iron and for even higher pressures in steel. E.S.

MACHINERY—FELTS

ORR FELT & BLANKET COMPANY, *Piqua, Ohio.* All wool and a dozen yards wide. Rohm & Haas Reptr. 10, no. 2: 1-7 (March-April, 1952).

The processes used by the company in the manufacture of papermaker's felts are outlined, including the sorting of the wool, scouring, weaving, felting, napping (in certain cases), and special resin treatments for which Orr holds the basic patents (Orr-Chem for improving the resistance to the action of chemicals and Orr-An-bac for increasing the resistance to bacteria and felt rot). In conclusion, blended fabrics, particularly wool-nylon combinations, and condenser-paper felts are mentioned briefly. 9 illustrations. E.S.

MACHINERY—PAPER MACHINE

ANON. St. Regis No. 4 machine at Pensacola in production. Paper Trade J. 134, no. 23: 12 (June 6, 1952).

A brief reference is made to the new Bagley & Sewall Fourdrinier machine of the Alabama Pulp and Paper Co. which made its first paper on April 2, 1952. The machine trims to 210 inches and is designed for an ultimate speed of 2400 f.p.m. Its rated capacity is 275 tons daily of kraft paper and board. 2 illustrations. E.S.

MACHINERY—REFINERS

KLEMM, K. H. The application of modern refining equipment to groundwood-mill operation. Wochbl. Papierfabr. 80, no. 9: 280-4;

no. 10: 315-18 (May 15, 31, 1952). [In German] *cf.* B.I.P.C. 22: 671-2.

Supplementing the data by Brecht and Müller, a Reisten mill (a refiner with three pairs of stone disks) (I) was included in the study of modern refiner types for groundwood screenings obtained in the operation of a newsprint mill. The other refiners used for comparison were three Voith-Naske stone refiners (II) and a conical refiner with steel tackle (III). The present data were obtained in a large German groundwood mill where the tailings from coarse and fine screenings are collected in a common chest and can be fed to either type of the three refiners. Measurements were taken in batch operation before and after a single pass of the pulp through the refiners and also during continuous operation. The data were recorded in agreement with those of Brecht and Müller to obtain directly comparable results. The principal interest centered in the performance of (I) which had hitherto not been employed for this purpose. The results obtained with (II) and (III) in batch operation were largely in agreement with those recorded by Brecht and Müller. (I) was found decidedly superior to (II) with regard to lower power consumption, higher throughput, and technical efficiency. On account of its high throughput, the machine is particularly suitable for large-scale operations, whereas (III) is recommended for the replacement of (II) in small- and medium-sized mills. The problem of satisfactory refining of groundwood tailings can only be solved in connection with an improvement of the entire groundwood-mill screening system. The advantages of multistage screening are emphasized, as well as the fact that the fine-screening stages do not yet operate with the desired efficiency. The installation of Jönssen Vibrotor screens between the coarse and fine screening stages is suggested for relieving the work of the fine screens. 6 tables, 7 figures, and 6 footnotes. E.S.

MACHINERY—ROLLS

BOYNTON, R. T. Roll cambering. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 12-20; discussion: 21-5 (1951).

The shortcomings of commercial grinders in imparting the theoretically correct camber to press and supercalender rolls are demonstrated, and methods of overcoming this deficiency in commercial grinders are suggested. The forces which act on rolls in a supercalender are analyzed, and the horizontal forces on the intermediate rolls are calculated. Of the two methods used in commercial supercalenders to overcome intermediate roll deflection, namely, intermediate roll cambering and intermediate roll stagger, the second is regarded as the better method. The factors affecting the deflection of an M.G. cylinder are discussed and the difficulties in arriving at the correct camber are stated. 1 figure and 2 references. E.S.

EĬDLIN, I. YA. The crowning of rolls for papermaking and finishing machines. Bumazh. Prom. 25, no. 3: 29-34 (May-June, 1950). [In Russian]

The various structural factors which should be considered in the design of crowned rolls are discussed, and a detailed mathematical analysis of the problem is presented. 9 figures. E.G.S.

LOTHMANN, FRANZ. The sagging of rolls. Wochbl. Papierfabr. 80, no. 10: 319-20 (May 31, 1952). [In German]

A diagram is presented with the aid of which the deflection of any roll can be determined with sufficient accuracy, provided the load is uniformly

distributed and the moment of inertia is approximately the same over the entire length of the roll. Both conditions usually hold for papermaking rolls. A knowledge of the amount of deflection is essential for determining the necessary crowning of a roll. An example of the application of the diagram is given. 2 figures. E.S.

MACHINERY—WIRES

SHAMOLIN, I. S. Prolonging wire life. Bumazh. Prom. 25, no. 1: 19-21 (January-February, 1950). [In Russian]

Various methods are suggested for extending the life of papermaking wires, including the covering of register rolls with an asbestos-vinyl material. The results of comparative service tests are included. 4 figures. E.G.S.

MATERIALS HANDLING

MACHELL, E. F. Handling wood waste at Harmac. Can. Pulp Paper Ind. 5, no. 6: 10-11 (June, 1952); Pulp Paper Mag. Can. 53, no. 7: 123-5 (June, 1952).

Over 90% of the mill's chip supplies are at present derived from wood waste. Of these, 80% come from a sawmill on tidewater and are transported in scows to Harmac; the other 20% (from clean wood picking and veneer waste) are delivered by truck from two mills about 60 miles distant from the mill. The installations for handling these chips from producer to consumer are outlined. In addition, the woodroom at Harmac is a very necessary part of the setup. The present production from this unit is used to balance the species distribution of chips received from outside sources; it also provides insurance against any failure in chip supply. 1 illustration. E.S.

METERS AND RECORDERS

GTHR. Surface thermometers for revolving rolls. Das Papier 6, no. 9/10: 185 (May, 1952). [In German]

A thermometer for the continuous indication of the surface temperature of revolving cylinders and rolls is described, which has been developed for temperature ranges from 0 to 100° and 0 to 300°C. and which is legible from quite large distances. It may also be combined with maximum- and minimum-temperature contacts and used as a control instrument. 1 illustration. E.S.

MILL CONTROL

BUTLER, R. A., and SYME, T. D. A quality "efficiency" rating for paper mill production. Pulp Paper Mag. Can. 53, no. 6: 116-20 (May, 1952).

Pacific Mills Limited, Ocean Falls, B.C., has developed a method for determining a quality efficiency percentage figure for production from a paper machine and has used this figure successfully in its quality control program. This method of evaluation takes into account sheet appearance, roll condition, and physical test features of production, together with diversion of tonnage from standard production for quality reasons. Through daily posting and discussion, the rating can be used effectively as a quality-control medium. The quality picture, in the form of a single, easily understood numerical value, makes it possible for operator and manager alike to compare critical grades on a run-to-run basis for the detection of drifts in quality, and to spot quickly any deviation from specification standards. 5 tables. L.C.

MILL MANAGEMENT

FOLEY, H. S. Some thoughts for technical men in the pulp and paper industry. Pulp Paper Mag. Can. 53, no. 6: 110, 115 (May, 1952); Can. Pulp Paper Ind. 5, no. 6: 28, 30 (June, 1952).

With reference to the current trends toward complete utilization and complete integration of forest units (the Ladysmith experiment, hydraulic barkers, the use of barkers and chippers in sawmills, and similar developments), the author mentions the challenge they present to management and technical people, and emphasizes the part which technical men can play in the lowering of costs. However, only through teamwork of engineering, research, and management can further progress in the industry be made in an organized way; in today's industrial activity, no man can live in an ivory tower. E.S.

POWELL, J. P. Profit rating as a tool of management, with specific reference to production planning in the paper industry. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 67-75; discussion: 76-8 (1951).

The author describes profit rating, defined as a method of measuring the relative profitability of a number of different products made on two or more paper or board machines. The method discussed is that used by Australian Paper Manufacturers Ltd. as an aid to sales and production planning, but is adaptable to the requirements of any other paper mill operating more than one machine. Briefly the system consists of an index of profitability for each machine based on a time unit; the index number is comparable between different machines by reference to a product common to them. The rate of profit used as the basis of the index of profitability can be chosen arbitrarily but should preferably be related to the capital employed by the company. 3 tables. E.S.

MOLECULAR WEIGHT

MÜNSTER, ARNOLD. Investigations on the system nitrocellulose-acetone. J. Polymer Sci. 8, no. 6: 633-49 (June, 1952). [In English; German and French summaries]

Nitrocellulose prepared from heterogeneously degraded cotton and dissolving wood pulp was divided into different fractions by adding water to the acetone solution. The osmotic pressure and the viscosity of each acetone solution at various concentrations were measured. Within a concentration range of 1.5-10 g./l. the reduced osmotic pressure shows a linear dependence on the concentration. The molecular-weight values obtained were in the range of 26,000 to 2,500,000. The value of the virial coefficient B in the osmotic pressure equation depends on the molecular weight. With increased molecular weight, the value of B decreases, at first strongly, later more slowly. This fact cannot be explained by the Flory-Huggins theory but depends on the flexibility of the rodlike molecules. An equation is given which shows the relationship between B and molecular weight in satisfactory agreement with the experimental data; it contains as a parameter the length of a statistical chain element (Kuhn's theory), as obtained by viscosity measurements. Schulz stated that the entropy of dilution of the system nitrocellulose-acetone differs but little from the ideal value. Consequently, the positive excess term calculated for the athermal solution has to be compensated by a further negative term derived from the solvation. Until now calculations of the solvation supplied positive terms only. Yet, a negative term is obtained when the fact is considered that the bond of the acetone molecules with

the nitrocellulose is fixing the orientation of the acetone molecule in a much stronger way than would be the case in pure acetone. The statistical mechanical calculation shows that this model gives satisfactory results. The measurements of the viscosity cannot be represented by the Huggins theory. The plotting of η_{sp}/c against c gives curves, the slope of which increases sharply with molecular weight, and no linear relationship can be reached by plotting η_{sp}/c against η_{sp} because the molecular weight is rather high. The intrinsic viscosity must therefore be determined by graphical extrapolation. These values are used to find the relationship between intrinsic viscosity and molecular weight and for the quantitative testing of the Riseman-Kirkwood theory (*cf.* J. Chem. Phys. 18: 512-16 [1950]). The Staudinger formula cannot be applied for higher D.P.'s, whereas the Riseman-Kirkwood theory was confirmed for D.P.'s as low as $n \sim 200$. Below this value systematic discrepancies occur, the reasons for which are discussed. The measurements seem to demonstrate the presence of small but characteristic differences between the molecular parameters of cotton cellulose and wood pulp. 2 tables, 15 figures, and 32 references. E.S.

SCHULZ, G. V. The determination of the molecular weight of macromolecular substances; a critical evaluation and comparison of different methods. Experientia 8, no. 5: 171-82 (May, 1952). [In German]

A survey is presented of the most important methods for the determination of the molecular weight, including osmotic pressure, ultracentrifuge and diffusion, light scattering, and Staudinger's viscosity method; the limitations of the methods are discussed and their results are compared. All methods require extrapolation to zero concentration to obtain equations which are valid for ideal solutions. In addition, the polymolecularity of the examined substance must receive consideration, because each method yields a characteristic average of molecular weight which differs from the others. At present a gap exists between the low molecular and macromolecular substances. The determination of molecular weights between 1000 and 10,000 still causes considerable difficulty. 4 tables, 14 figures, and 55 footnotes. E.S.

NEWSPRINT—STATISTICS

TIPKA, VERNON L. Newsprint review; world—United States—Canada. Pulp & Paper 26, no. 7: 162-3 (July 1, 1952); *cf.* B.I.P.C. 22: 504.

In the article, an abridgment of the author's annual newsprint review, United States and Canadian production and consumption of newsprint for 1951 are discussed and figures on exportation are given. The author also includes a few remarks on 1952 production thus far. 4 tables. L.C.

NOMOGRAPHIC CHARTS

BERNINGHAUS, H. The graphical determination of the length of the paper web and the number of blanks in paper rolls. Allg. Papier-Rundschau no. 9: 415-17 (May 12, 1952). [In German]

A nomogram is presented as an aid in paper conversion which is based on the formulas of Gut (*cf.* B.I.P.C. 21: 613). E.S.

PACKAGING

FOOD ENGINEERING. Progress report on packaging the gobbler. Food Eng. 24, no. 6: 88-9 (June, 1952); *cf.* B.I.P.C. 17: 378.

New developments in the packaging of turkeys include individual vacuum packaging in Cry-O-Vac bags with subsequent shrinkage in hot-water immersion tanks prior to insertion into waxed, lithographed cartons in which the birds are frozen (consumer packaging) and the bulk "Uni-Pak" system, according to which the bagged birds are sorted in 4-oz. increments and four of the same weight packed in a single crate prior to freezing; the second method involves less handling and provides considerable savings in packaging costs. 4 illustrations. E.S.

MODERN PACKAGING. Eastman Kodak film. Modern Packaging 25, no. 10: 98-104, 196, 198-9 (June, 1952).

A history of the Eastman Kodak Co.'s film-packaging problems is given, and the development of light, moistureproof foil wrapping and backing paper is related. The packaging process from spooling the film to the automatic cartoning operation is described in detail. 24 illustrations. L.C.

MODERN PACKAGING. Glow-color packages. Modern Packaging 25, no. 10: 87-91 + 1 sample sheet (June, 1952).

Silk-screened, bronzed, gravure, and aniline-printed fluorescent colors are coming into wide use for package decoration. The colors are up to four times as bright as ordinary hues, and the inks meet Federal specifications for low-toxicity food-packaging materials. 5 illustrations and 9 footnotes. L.C.

MODERN PACKAGING. Long-lived display. Modern Packaging 25, no. 10: 110-11 (June, 1952).

The I. B. Kleinert Co., makers of Sava-Wave swim caps, needed a package which would eliminate the folding of the product and assume a prominent position among similar notions displays. A triangular-shaped carton, called the "solo display pak," was designed; its three tilted display surfaces keep the sales story always in view. 3 illustrations. L.C.

MODERN PACKAGING. New jobs for spiral wraps. Modern Packaging 25, no. 10: 105-7 (June, 1952).

Spiral wrapping is often the solution for shipping problems involving "straight-length" products, such as rolls of floor covering, carpet-sweeper handles, etc. The secure, rigid package, continuously glued, will not unwind even if the wrap is broken at several points. Improved conveyors and continuous printing methods make spiral wrapping practicable. Longitudinal rip cords facilitate opening of the package. 6 illustrations. L.C.

RADA, EDWARD L. Flowers from Hawaii. Modern Packaging 25, no. 10: 124-8, 193 (June, 1952).

Among the problems encountered by Hawaii's flower shippers are those of protecting an extremely fragile product against crushing, temperature extremes at semitropical way stops and at high altitude, rotting, fading, and other plant ills. Having found no package which meets all conditions adequately, every shipper attempts to solve these problems in a different way. The author describes the containers in use at present and cites the strong points and shortcomings of each. 9 illustrations. L.C.

VULKER. Packaging agricultural produce in paper. Neue Verpackung 5, no. 4: 100-1 (April, 1952). [In German]

An expendable package is described which consists of strong kraft paper reinforced with wire and wooden cleated ends; it is recommended for the

shipment of perishable products, particularly fruits and vegetables. 1 illustration. E.S.

PAPER—COATED

ANDELLA, DEE JAMES. Multicolor letterpress printing. Tappi 35, no. 6: 123-8A (June, 1952).

Following a brief discussion of important points on copy, plates, inks, press techniques, and equipment, the author outlines the advantages of coated paper for fine reproduction of color illustrations and lists the following requirements of a quality paper for this purpose: consistent performance; uniform formation; surface smoothness and strength; uniform thickness; good opacity, brightness, and color; resiliency; balanced moisture content; and a high degree of permanence in color and body stock. E.S.

PAPER—FILLERS

FLYATE, D. M. Influence of fillers on the strength and air permeability of paper. Bumazh. Prom. 25, no. 2: 21-4 (March-April, 1950). [In Russian]

The relationships between filler content and the strength and air permeability of paper are shown in graphical and tabular form. The physical theory underlying the action of fillers is also discussed. 1 table, 3 figures, and 7 references. E.G.S.

PAPER—PERMANENCE

LANGWELL, W. H. The permanence of papers. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 1: 21-8 (February, 1952).

The author criticizes the prevailing theories with regard to the lack of paper permanence and presents evidence that the kind of damage to paper experienced in libraries is due to hydrocellulose formation which results from the action of a strong acid. Analyses of papers from old books showed clearly the presence of sufficient strong acid to account for the destruction of even the best rag paper, whereas the location of the acid at the edges indicated atmospheric attack as the source of the acid beyond all doubt. The increasing impermanence of paper during the last 150 years is shown to correspond fairly closely with the increasing consumption of coal in the United Kingdom and the amount of sulfur dioxide likely to be found in the atmosphere (estimated 5,000,000 tons of sulfuric acid released to the atmosphere per year). In the presence of a sufficient amount of catalytic metal in the paper, the sulfur dioxide under atmospheric conditions will be oxidized; a quantitative method, the Bottomley test (*cf.* Analyst 75:501 [1950]), was used for determining its presence. Iron was found to be the most important catalytic metal responsible for the deterioration; manganese, although it is equally effective as iron, is only present in minute traces in normal papers, and copper appears to have a minor influence. The need for a more realistic accelerated aging test than the one based on the decrease of folding endurance of papers after exposure to high temperatures is emphasized. A modification of the test developed by Innes (*cf.* Lib. Assoc. Record 52: 458 [1950]) for the evaluation of leather exposed to certain concentrations of sulfur dioxide in the atmosphere is suggested. This test might be used for determining the efficacy of various methods of stabilizing unstable papers (removal of metals, incorporation of alkalies or buffers, sealing with impervious varnishes or coatings, use of catalyst poisons, and storage in an atmosphere free from sulfur dioxide and other acid gases). 2 tables, 1 figure, and 3 references. E.S.

LANGWELL, W. H. The permanence of paper. Part II. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 2: 52-7 (April, 1952).

For testing the effectiveness of catalyst poisons, two methods were developed: a rapid method which gives results in as little as 16 hours (I), and a slower, more critical method which requires at least 28 days (II). In (I), freshly prepared stock solutions of aqueous hydrochloric acid, ferric chloride, and anhydrous sodium sulfite to which different inhibitors were added were allowed to stand in amber glass bottles at laboratory temperatures with the cap screwed down for 16 hours. The increased amount of sulfate in the resulting solution was determined by precipitation as barium sulfate and weighing. The results showed that disodium pyrophosphate was the best of the inhibitors examined. Nine of the more effective inhibitors were then tested for 168 hours, with the result that all but α-naphthol, ammonium oxalate, and disodium pyrophosphate were eliminated. The principal value of (I) lies in the preliminary rough classification of new inhibitors. In (II), 1-gram samples of commercial newsprint treated with inhibitors were loosely folded, placed in test tubes, and exposed to an air-sulfur dioxide atmosphere in closed jars at room temperature for 28 days. The results of these preliminary experiments showed that only ammonium oxalate and oxalic acid were effective; they also indicate clearly that the permanence of papers, including newsprint, could be greatly improved by quite simple means. 9 tables and 4 references. E.S.

PAPER AND PULP INDUSTRY

ATCHISON, JOSEPH E. The European pulp and paper industry moves ahead. Tappi 35, no. 6: 10A, 12A, 14A, 16A (June, 1952); World's Paper Trade Rev. 137, no. 23: 1655-6, 1658, 1660 (June 5, 1952).

The author reviews the accomplishments of the Economic Cooperation Administration (ECA) and its successor, the Mutual Security Agency (MSA), and the progress the pulp and paper industry has made in the countries involved. E.S.

CALKIN, JOHN B. This industry's future; looking ahead through chemist's eyes. Pulp & Paper 26, no. 7: 26, 28-9 (July 1, 1952).

The author reviews recent technical advances throughout the paper industry; he cites improvements in the pulping processes such as the use of ammonia as a pulping base in the sulfite process and sodium peroxide and chlorine dioxide as pulp bleaches. Lignin and possible products derived from it, paper and paper products in general, and the integration of forest industries are also discussed. 2 illustrations. L.C.

PULP & PAPER. [1952 world review] Pulp & Paper 26, no. 7: almost the entire issue (July 1, 1952); *cf.* B.I.P.C. 22: 31.

A summary and statistics of the pulp and paper situation throughout the world are presented. The following sections are included: North America (Stevenson, Louis T. U. S. A., past—future, p. 49-50, 52-4, 148; Anon. Canada, p. 58-9, 172-5); Russia—Communist Europe, p. 72-3; Europe (United Kingdom, Eire, France, Italy, Belgium, The Netherlands, Switzerland, Spain, Portugal, Austria, West Germany, Denmark, Finland, Sweden, Norway, and Greece), p. 76, 78, 80, 82, 84, 89, 92, 96, 98-100, 104, 106, 108, 110, 112, 114, 116; Latin America (Brazil, Uruguay, Argentina, Chile, Guatemala, Mexico, Colombia, Peru, and the rest of America), p. 117-20; Asia (Japan, Taiwan [Formosa], Hongkong-China, The Philippines, India, Pakistan, and

the rest of Asia), p. 120B-D, 122, 124; Africa (South Africa, Middle Africa, North Africa), p. 128, 130, 132; Oceania (Australia, New Zealand, Hawaii), p. 132, 134, 137-8. Tables and illustrations accompany most of the articles. In addition, statistical information on the different branches of the industry is scattered throughout the issue. L.C.

SHATTUCK, GORDON B. Papermaking economics: the new and the old. Paper Ind. 34, no. 3: 360-3 (June, 1952); Paper Mill News 75, no. 25: 16-18, 20, 25 (June 14, 1952); Am. Paper Converter 26, no. 7: 20-1, 62-4 (July, 1952); *cf.* B.I.P.C. 22: 120.

The author discusses the respective positions in industrial economics of the old and small mills of the Northeast and the new and large units in the South which present a real threat and competition to the former. It will be inevitable that some of the markets will be taken from the northern mills which, in order to survive, must adapt their products to the more available markets lying in the direction of specialty (technical or tailored) products. These do not require big tonnages and high speeds to pay off the capital investment. The size of this potential new market is commonly not appreciated; the problem of re-adaptation will vary with each individual mill, and the correct solution in one place may not apply in another. Examples of a few specific instances are given where some of the New England mills have developed new and useful products which have paid dividends; they are better or less expensive than a former product on the market or so entirely new in character that a definite market has been created for them (a dielectric spacer in electrical capacitors, a synthetic leather, two-color papers for advertising pieces, a duplex paper for lithographed boxes, battery plates from redwood-bark fibers, paper for the Kemart reproduction process, impregnated papers for bookbindings and shotgun-shell closures, and wrappings for x-ray and light-sensitive films). The northeastern mills must plan now to take those steps which will prepare them to assume their new role in the changing economy, some of which include the risk of money for new projects, flexible equipment, the investment in technical personnel, and the application of strict scientific and technical control. 1 table and 1 diagram. E.S.

VINCENT, REX. Non-paper cellulose; rayon, acetate, cellophane, plastics, etc. Pulp & Paper 26, no. 7: 142-3, 145 (July 1, 1952); *cf.* B.I.P.C. 22: 31.

The author discusses North American production and consumption of dissolving pulp during 1951 in the rayon, acetate, cellophane, plastics, and miscellaneous industries. 7 tables. L.C.

VOORN, H. Paper making in the Netherlands. Pulp Paper Mag. Can. 53, no. 6: 90-7 (May, 1952); *cf.* B.I.P.C. 22: 510.

An outline of the present paper industry in Holland is given, including notes on the most important mills, research institutes, and associations. A list of mills and a map showing their location are appended. 2 maps and 12 illustrations. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

CAPLES, WILLIAM G. A planned industrial relations policy. Fibre Containers 37, no. 6: 63-4, 66, 68, 73 (June, 1952).

The author outlines the industrial relations policy adopted seven years ago by the Inland Steel Co.; he recognizes industrial relations problems in the

paper industry which parallel his own, and he describes appropriate personnel testing systems, ways to deal with unions, safety and health measures, and good community relations. L.C.

PAPER AND PULP MILLS

PAPER INDUSTRY. Westvaco completes modernization program. Paper Ind. 34, no. 3: 356-8 (June, 1952); *cf.* B.I.P.C. 22: 681.

The postwar rehabilitation program at the Covington, Va., mill is described; essentially the same information as in the previous articles is presented. 5 illustrations. E.S.

PAPER CONDITIONING

Jö. Moisture content of a calendered wrapping paper from the paper machine to the shipping room. Allg. Papier-Rundschau no. 10: 470 (May 26, 1952). [In German]

Reference is made to the importance of proper paper conditioning in the storage rooms of paper jobbers and converters. However, the paper is also exposed to considerable temperature and moisture variations in the paper mill during its manufacture, and care should be taken that it leaves the mill's shipping room with the correct moisture content. Three diagrams are presented which illustrate the variations to which wrapping-paper rolls (taken at random from normal production runs) are exposed during the different steps before calendering, and after humidifying, storing, calendering, and shipment, and which emphasize the need for proper moisture control in the mill prior to shipment. 3 diagrams. E.S.

KOTTE [HANS] The conditioning of paper by the printer. Allg. Papier-Rundschau no. 9: 420-2 (May 12, 1952). [In German]

Different paper-conditioning systems for installation in the printing room are described. 5 illustrations. E.S.

PAPER SPECIALTIES

ARGY, M. The manufacture of gummed paper. Papeterie 74, no. 5: 274-5, 277, 279, 281 (May, 1952). [In French]

The author describes briefly control tests employed in the testing of the base paper, adhesives, plasticizers, preservatives, and perfumes used in the manufacture of gummed paper, as well as the manufacturing processes themselves. Formulas for a few adhesives are given. 2 diagrams. L.E.W.

BÖTTINGER, GEORG. Creped paper and its significance. Allg. Papier-Rundschau no. 8: 376-7 (April 24, 1952). [In German]

The procedures involved in the manufacture of water-creped paper and the required machinery are described. 1 illustration. E.S.

CARBORUNDUM COMPANY. *Coated Products Division, Niagara Falls.* Rough time with sandpaper until moisture tests spotted flaws. Chem. Processing 15, no. 6: 96 (June, 1952).

Reference is made to the importance of the proper moisture content, particularly of the backing of paper, cloth, or fiber combinations, in the manufacture of sandpaper. The use of the Tag Midget moisture meter (which employs the electrical-resistance principle) for regularly checking the mois-

ture content of the base paper, the coated material, and the finished product, and the resulting advantages (improved quality and elimination of waste caused by faulty processing) are described. 2 illustrations. E.S.

GLADKIKH, M. A. Fundamental problems in fine paper production. Bumazh. Prom. 25, no. 2: 18-20 (March-April, 1950). [In Russian]

The manufacture of fine paper by various mills in the Soviet Union is discussed. E.G.S.

O'SHAUGHNESSY, FRANCIS. Throw-away filter medium. Chem. Eng. 59, no. 6: 169-71 (June, 1952); *cf.* B.I.P.C. 22: 347.

The use of neoprene-treated, high wet-strength filter paper at the Deepwater plant of Du Pont is described. Called Netone-5 filter paper, it is a 100-pound porous kraft paper, to which 5% of neoprene latex has been added in the beater. It can replace cotton duck in many services, or it may be used in combination with duck. Its physical and chemical properties are adequate for many uses; correct applications and limitations of the material are discussed. 1 table and 1 illustration. E.S.

PATENTS

ANON. Machine coated paper patent invalid. Paper Mill News 75, no. 23: 5, 14, 16; no. 26: 39 (June 7, 28, 1952); Tappi 35, no. 7: 86A, 88A, 90A (July, 1952).

The U. S. patent 1,921,368 issued to Peter J. Massey on Aug. 8, 1933 (which expired in 1950) and which covered the application of coating color by an offset printing method has been declared invalid. The decision in the infringement suit brought by Massey and the present owners of his patent, Consolidated Water Power & Paper Co., against Kimberly Clark Corp. reads that "The Court is of the opinion that the defendant has not infringed the plaintiff's patent." The full decision will be filed at a later date; the filing of an appeal cannot be made until this decision is available. Details of the suit are given. E.S.

WEST, CLARENCE J. United States patents on papermaking, first quarter, 1952. Tappi 35, no. 6: 162-7A (June, 1952); *cf.* B.I.P.C. 22: 516.

An annotated list of patents for the first quarter of 1952 is presented. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

GASSER, F., and ZUKRIEGEL, H. "Heliotest"—a new rapid tester for fastness to light. Melliand Textilber. 33, no. 1: 44-5 (January, 1952). [In German; English, French, and Spanish summaries] *cf.* B.I.P.C. 22: 348-9.

Following a critical survey of the different procedures for the evaluation of light fastness at present in use, the authors describe a new instrument for rapid control work in factories, such as dyehouses, textile and paper mills, etc. The instrument consists of a heliostat with a lens system attached to it; the lenses concentrate the solar rays so that they react with 25 times their normal intensity upon the test samples and their controls. A difference in the behavior of dyes when exposed to normal sunlight for an extended period or to the concentrated light in the accelerated tests has not been observed. 1 table and 3 figures. E.S.

PHYSICAL TESTING—INK

WALKER, W. C., and ZETTLEMOYER, A. C. NPIRI Planetary Rubometer. Am. Ink Maker 30, no. 6: 59-61, 113 (June, 1952); Modern Lithography 20, no. 7: 49-51, 53 (July, 1952).

The development of an instrument for the evaluation of the rub resistance of printing inks is described; the NPIRI Planetary Rubometer (I) is not available at the present time and will not be placed on the market until its superiority has been definitely established. The portable instrument is designed to be placed directly on a sheet of printed matter in the region to be tested; no cutting of samples and clamping in place is required. A 1.5-inch square of the material to be rubbed against the print is cut and placed under the rubbing shoe of (I). A control knob is set to the desired number of rubs and a proper weight put in place, thereby adjusting the instrument to the desired severity of rubbing action. The machine is started and allowed to run with a circular motion until it stops automatically, whereupon (I) is removed and the results are examined; they may be reported in terms of reflection-meter readings, in terms of comparison with a standard, or the ruboff pattern and print may be directly attached to the report. 3 figures.

E.S.

PHYSICAL TESTING—PAPER

BRECHT, WALTER, and KÖRNER, LUDWIG. The accuracy in testing of paper properties. Das Papier 6, no. 9/10: 161-9 (May, 1952). [In German]

To find a criterion for the required accuracy of the most generally employed paper testing methods (which was required in connection with the issuance of a new German Standard V/14 "The checking of instruments for paper testing"), a review is presented of the variations in the individual testing procedures when the same instrument is used in each case. The following properties were investigated: basis weight (I), thickness (II), tensile strength (III), stretch (IV), burst (V), folding endurance (VI), tear-through according to Brecht-Imset (VII) and Elmendorf (VIII), and air permeability (IX). Experiments with a wood-free writing paper (basis weight 75 g./sq. m.) showed considerable variations in the different properties tested. For 100 individual measurements for each experimental point, the average scatter of the individual values was the smallest for (I) and (II) and considerably larger for the strength properties: it was comparatively slight for (III), about equally large for (VII) and (VIII), somewhat larger for (V), and of considerable magnitude for (IV). However, the greatest variations were found in the determination of (VI). When the study was extended to three additional paper samples (a laboratory sheet prepared upon the Rapid-Köthen sheet machine, a printing paper containing groundwood pulp, and a sulfate bag paper, all of approximately the same basis weight), each paper showed the same trend and approximately the same scatter of the individual test values. Since the samples included a laboratory and three machine-made papers with inherently different characteristics, it seems certain that the variations in the test results were dependent upon the peculiarities of the testing instruments and not upon the properties of the individual papers. In addition, the authors determined the accuracy with which the mean value of 10 individual tests represents the measured paper property. For this purpose, the scatter ranges of all mean values from 10 tests each of all four paper samples were calculated, and a comparison of the calculated values with those actually determined gave a probability of 99%. The difference in magnitude of the individual scatter ranges indicates that the individual paper properties are determined with a different degree of accuracy when the same number (10) of individual

tests is employed. If all properties were to be determined with an accuracy identical with that resulting from 10 tests for (III), the measurement of (V) would require 20, of (IX) approximately 30, of (IV) nearly 40, and of (VI) at least 200 individual tests. 4 tables, 2 figures, and 16 footnotes. E.S.

PHYSICAL TESTING—PAPER—BASIS WEIGHT

ANON. Continuous contactless measurement of the basis weight of paper webs. Allg. Papier-Rundschau no. 8: 373-4 (April 24, 1952). [In German]

The beta gage manufactured by Friesecke & Hoepfner GmbH, Erlangen-Bruck, Germany and its mode of operation are described. 1 diagram. E.S.

PHYSICAL TESTING—PAPER—BONDING OF FIBERS

IVANOV, S. N. Fiber-to-fiber bonds and paper strength. Bumazh. Prom. 25, no. 2: 24-7 (March-April, 1950). [In Russian]

In a discussion of the longitudinal and lateral orientation of fibers in a paper sheet, it is pointed out that a larger zone of rupture is encountered in a lengthwise, overlapping arrangement of fibers. The shear resistance of a two-ply laminated sheet is suggested as a measure of the strength of interfiber bonds. Extensive reference is made to Breĭtveĭt's investigation of fiber-to-fiber bonds (*cf.* B.I.P.C. 20: 163). 1 figure. E.G.S.

PHYSICAL TESTING—PAPER——FOLDING ENDURANCE

VAN NEDERVEEN, G., and VAN ROYEN, A. Some considerations of the correlation between folding number and tensile strength. Papierwereld 6, no. 1: 5-11; no. 2: 41-6 (August, September, 1951); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 28, no. 10-12: 68 (October-December, 1951). [In Dutch; abstract in English]

The authors show empirically that the folding number is dependent upon the tensile strength of the paper, although the form of the correlation is still uncertain. When the paper is folded under a variable load (as in the Köhler-Molin tester), the folding number decreases markedly when the load is increased. There is no advantage in folding papers under loads which are constant percentages of the tensile strengths in each case. The thickness and age of the paper also play important roles in folding endurance. Fiber length clearly enhances the folding strength, since the fibers themselves are not broken, but merely pulled apart when the paper fails on folding. If the paper is treated with formaldehyde (making the fibers brittle), the fibers snap in this case, although the tensile strength is hardly lowered at all. The suppleness or rigidity of the fibers also affects the folding behavior. The determination of the loss in tensile strength after a certain number of double folds in the samples led to the conclusion that this loss in strength is a linear function of the logarithm of the number of double folds. If such a logarithmic relationship is assumed between folding number and tensile strength, the behavior of paper in folding is explained, especially the wide spread of experimental results for folding number. A formula has been developed correlating the logarithms of the folding number and tensile strengths and load, which also agrees with the observed fact that, on beating of the pulp, the folding endurance of the paper increases more than the tensile strength. Hence, in comparing the folding strengths of different papers, the logarithms of the folding numbers should be used. The mechanism of the

folding action on the Schopper and Köhler-Molin testers, although externally different, seems to be the same in principle, so that their results (which are approximately the same with a load of 600 g.) may be compared. 4 tables, 10 figures, and 2 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

ANON. Standardizing paper surface gloss. Indian Print & Paper 17, no. 70: 30, 54 (January, 1952).

The mode of operation of the Ingersoll glarimeter is described; the first mills in India to make use of the instrument were the big modern newsprint mills. For the use of the average printing office British-made instruments are available, such as the Sheen glossmeter. E.S.

PHYSICAL TESTING—PAPER—HOLES

BEKK, JULIUS. Contributions to paper testing; the problem of detecting minute holes in paper. Allg. Papier-Rundschau no. 9: 422 (May 12, 1952). [In German]

Two simple methods for detecting very small holes (*a*) in the coated layer of coated art or chromo papers, and (*b*) in thin parchment papers are described. The holes in (*a*) result from the bursting of small foam bubbles present in the coating mix which, when they occur in large numbers, can seriously impair the quality of the printed piece. The defective paper is first rubbed with a red wax crayon (as used for writing on glass), then wiped clean with cotton wadding. The smooth surface of the paper hardly retains the fatty substance and becomes lightly rose colored; the foam holes, on the other hand, retain the crayon and show the number and distribution of the holes by the presence of dark red points. With regard to (*b*), thin parchment papers sometimes contain minute holes which do not show up on irradiation; however, they detract seriously from the paper's suitability for wrapping butter or other fats. For detecting the presence of this defect, a smooth copper plate is covered uniformly with black printing ink, the parchment paper placed on top of the ink, followed by a coated art sheet and a smooth, not too soft rubber pad, about 1 mm. thick or a layer of 10 newsprint sheets. The assembly is exposed to strong pressure in a suitable press for five minutes. On removal from the press, the ink has penetrated through the holes in the parchment paper to the coated art paper which shows the presence and distribution of the holes in the form of black points. For obtaining comparable results, the identical ink at the same temperature and pressure and for the same period should always be used. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

HARDACKER, K. W., and RAWCLIFFE, R. D. Instrumentation studies. LXXI. Methods of measuring the moisture content of paper. A study of the effect of moisture content on the electrical resistance of paper and an evaluation of the Hart Moisture Meter and the Moisture Register. Tappi 35, no. 6: 168-82A (June, 1952); *cf.* B.I.P.C. 22: 763-4.

A study has been made of the reliability of the Hart Moisture Meter and the Moisture Register as instruments for measuring the moisture content of paper. In addition, a general investigation of the variation of the electrical resistance of paper with moisture content has been carried out. Measurements were made to determine the effect on the resistance-moisture characteristic of variations in fiber furnish, beating, pH, dyes, size, density, basis weight,

and ash content of the sheet. The effects of most of these variables were large enough to make it necessary to obtain a separate Hart Meter or Moisture Register calibration curve for each sheet. 6 tables, 23 figures, and 27 references. E.S.

PHYSICAL TESTING—PAPER—OIL PENETRATION

PIHL, L., and OLSSON, I. The penetration of viscous oils into porous papers. Grafiska Forskningslaboratoriet Medd. no. 28: 58-72 (February, 1952). [In Swedish; English summary] *cf.* B.I.P.C. 22: 763.

The article contains essentially the same information as given in the previous reference, although the two articles are not identical. 8 tables, 4 figures, and 4 references. E.S.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

KOTTE [HANS] An instrument for measuring the pick resistance of coated printing paper; the new Hercules print tester. Allg. Papier-Rundschau no. 10: 464-5 (May 26, 1952). [In German] *cf.* B.I.P.C. 22: 193-4.

This is a free translation of the article by Barber and Davis. 3 illustrations. E.S.

WHEELER, GORDON C., and REED, ROBERT F. Pick testing of offset papers. Tappi 35, no. 6: 272-6 (June, 1952).

The printing impression and the factors that contribute to picking of paper during printing are discussed. The press conditions that should be simulated in a pick test are printing surface, ink-film thickness, pressure, period of contact, and rate of separation of printing surface and paper. A simple pick tester has been constructed which approximately meets these conditions. It consists of an unbalanced flywheel which acts as a pendulum and causes a spring-loaded, inked hammer to strike the paper sample. A series of eight tack-tested inks is used, and the pressure, period of contact, and rate of separation are adjusted to give the same results as an offset press at normal printing speed. 2 tables, 6 figures, and 7 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

PIHL, LENNART. The ink transfer to paper in printing. Svensk Papperstidn. 55, no. 10: 358-62 (May 31, 1952). [In English] *cf.* B.I.P.C. 22: 350.

This article contains in condensed form essentially the same information as the previous reference. 1 table and 3 figures. E.S.

PIHL, LENNART, and OLSSON, INGEMAR. The ink transfer to newsprint in printing under different conditions. Grafiska Forskningslaboratoriet Medd. no. 28: 44-57 (February, 1952); Svensk Papperstidn. 55, no. 12: 421-5 (June 30, 1952). [First reference in Swedish; English summary. Second reference in English; Swedish summary]

The authors studied the influence of the printing pressure, the printing speed, and the ink viscosity with various amounts of ink present in the form on the ink transfer to newsprint (I). Increasing viscosity and speed were found to decrease (I), whereas higher printing pressures increase it.

The experiments were carried out and interpreted by means of statistical methods (analysis of variance). 8 tables, 4 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—SAMPLING

HEDLUND, INGVAR. An observation on sampling efficiency in tensile strength testing of paper. Svensk Papperstidn. 55, no. 10: 363-5 (May 31, 1952). [In English; German and Swedish summaries]

In testing the tensile strength (breaking length) of paper, it is common practice to cut and test several adjacent strips. Statistical evidence is presented to illustrate the loss in accuracy when this practice is followed. The strips for paper testing should never be cut less than 5 cm. apart, preferably even more; in circular handsheets they can be cut at right angles. To obtain a certain degree of accuracy in testing adjacent strips, it is necessary to cut a far greater number of samples than if uncorrelated strips are selected; this lack of knowledge of the correct sampling technique leads to unnecessary waste in testing work. 2 tables, 4 figures, and 1 reference. E.S.

PHYSICAL TESTING—PAPER—STIFFNESS

LEIDL, E. Paper stiffness, its significance, and measurement. Allg. Papier-Rundschau no. 10: 467-8 (May 26, 1952). [In German] *cf.* B.I.P.C. 19: 106.

A resume of the article by Hoffmann-Jacobsen is presented. 1 diagram. L.E.W.

PHYSICAL TESTING—PAPER—STRETCH

VOĬTSEKHOVSKIĬ, R. V. Stretch in paper. Bumazh. Prom. 25, no. 2: 27-30 (March-April, 1950). [In Russian]

The results of stretch tests made on sheets prepared from long- and short-fibered pulps are presented. Tearing length, shear angle, and folding-endurance data are also reported for the same sheets. 2 tables and 2 figures. E.G.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

LANDROCK, A. H., and PROCTOR, B. E. The simultaneous measurement of oxygen and carbon dioxide permeabilities of packaging materials. Tappi 35, no. 6: 241-6 (June, 1952); Modern Packaging 25, no. 10: 131-5, 199-201 (June, 1952).

A method for measuring the oxygen and carbon dioxide permeabilities of sheet packaging materials, based on Dalton's law of partial pressures, is described. The test sheet is mounted between two chambers; the lower contains nitrogen and the upper is swept with a mixture of oxygen and carbon dioxide. These gases permeate the sheet into the lower chamber at a rate dependent on their partial pressure differentials across the sheet. After small amounts of the gases have penetrated to the nitrogen side of the sheet, the gaseous mixture there is analyzed for oxygen and carbon dioxide. The results approximate actual packaging conditions, because the driving force across the sheet remains nearly constant, and the pressures on both sides of the film are essentially atmospheric. 1 table, 6 figures, and 18 references. E.S.

PHYSICAL TESTING—PAPER BAGS

RAGOSSNIG, L. The dynamic strength of kraft bag papers. Österr. Papier-Ztg. 56, no. 11: 11-; no. 12: 7-(1950); Tech. Bull. Tech.

Sect., Brit. Paper and Board Makers' Assoc. 28, no. 7-9: 51 (July-September, 1951). [In German; abstract in English. Abstract only available]

As known from practical operation, the data generally used for testing paper strength, such as breaking length, bursting strength, tensile strength, and stretch, do not represent useful criteria for evaluating the strength of bag papers in usage. The strength of a paper is, to a great extent, caused by bonds between the individual fibers. By a free fall of a filled paper bag, a portion of this strength is destroyed, because a certain number of the elements become separated from each other. In repeated falls, the strength counteracting the energy of fall will be smaller than in the first drop, so that the number of elements torn from each other will become greater with each successive drop until the bag finally breaks. The author carried out experiments and calculations to investigate the strength of bag paper under dynamic stress; he used suitable testing apparatus which he developed especially for this purpose, in which he employed cylinders of test paper filled with lead shot. He introduces three terms for the calculations presented in the article: the general dynamic strength modulus (I), the primary dynamic strength (II), and the breaking constant (III). (III) characterizes the degree of the decrease in strength during repeated stresses, and (II) may be determined by destroying the primary strength with a single application of a sufficiently large dynamic stress and determining the energy used. (II) and (III) represent generally valid criteria for the dynamic strength of bag papers. Papers with a high (II) are resistant to momentarily applied forces, such as when bags are thrown. A small value for (III) indicates resistance of a paper toward repeated applications of low energy. This will explain the purposes for which slightly creped paper is useful, even though its tensile strength is relatively low. Its (II) values are, in general, higher than those for uncreped papers of the same substance; in addition, its (III) value in the elastic range is lower than for other papers because of its extreme pliability. If the applied stresses in practice lie within the elastic range (which is generally the case), the life of a slightly creped paper bag exceeds that of uncreped paper bags. It was also found that the (II) value of the bag papers cannot be increased with increased beating degree. If (II) is principally considered, it is uneconomical to beat beyond 30° S.-R., although lower (III) values may be obtained by longer beating in the case of uncreped bag papers. For creped papers, a higher beating degree affects only the (III) value in the adhesion zone which is of no importance to its resistance against applied energy, since its very loose structure is completely destroyed after passing the strain limit. E.S.

PHYSICAL TESTING—PULP—CONSISTENCY

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Pulp-water relationships. Pulp Paper Mag. Can. 53, no. 6: 128-9 (May, 1952).

Two new tables issued in May, 1952 are reproduced. Data sheet Z-1 gives weight and volumes of liquid pulp stock in U. S. gallons up to 30% consistency, and Data sheet Z-la the corresponding figures for consistencies between 30 and 100%. 2 tables. E.S.

PHYSICAL TESTING—PULP—FREENESS

TAYLOR, RAYMOND E., and DAVIS, D. S. An accelerated freeness test for slow stock. Paper Ind. 34, no. 3: 359 (June, 1952).

Sedimentation studies were made with various stocks in the Williams pre-

cision freeness tester at 25°C., 3 g. of fiber based on ovendry weight, taking stop-watch readings at 100-ml. intervals, and plotting these against 1-liter readings, i.e., freeness values. The resulting curves revealed an excellent correlation between the time elapsed for the drainage of 500 ml. and the passage of 1000 ml. This relationship is expressed mathematically. Thus the drainage time can be cut to about one sixth by reading the stop watch after passage of 0.5 liter instead of the usual 1-liter drainage. The relationship holds for beaten and unbeaten sulfite, soda, groundwood, and mixtures of sulfite and groundwood, but is especially applicable to pulps whose freeness values are greater than three minutes. 1 table, 2 figures, and 3 references.
L.E.W.

PHYSICAL TESTING—WOOD—SAMPLING

STEWART, C. M., FOSTER, D. H., COHEN, W. E., LESLIE, R. T., and WATSON, A. J. The selection and preparation of a reproducible wood sample for chemical studies. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 267-311; discussion: 312-14 (1951); *cf.* B.I.P.C. 22: 684-5.

This gives essentially the same information as the previous reference, although in considerably greater detail. 7 tables, 3 figures, and 47 references.
E.S.

PITCH TROUBLES

GUSTAFSSON, CHARLEY, TAMMELJA, VILJO, and KAHILA, SEPPO. On pitch troubles caused by sulphite pulp. Paper and Timber (Finland) 34, no. 4a: 121-6, 128 (Special issue, April, 1952); Paper-Maker (London) 124, no. 1: 38-45 (July, 1952). [In English]

Following a brief review of the most important (and frequently conflicting) theories on the formation of harmful pitch (I) deposits in the manufacture of sulfite pulp, an apparatus is described for determining the amount of (I) deposited on copper surfaces from a mechanically agitated pulp suspension; the tester consists of an eight-liter copper vessel with a motor-driven copper propeller. Different grades of sulfite pulp were used in the studies. The influence of the pH and the temperature of the suspension, as well as the addition of sodium bicarbonate, oxidizing and reducing agents, calcium ions, aluminum sulfate, and water-softening and surface-active agents have been investigated. The order of addition of rosin and alum and its influence on the amount of (I) deposited are discussed. The authors found that when the rosin size is added before the alum (the general papermaking practice), the amount of (I) deposited on the walls of the vessel and the propeller is considerably larger than when this order is reversed. Among the factors investigated, the pH value undoubtedly has the greatest influence on the result; the influence of the temperature seems to be dependent on the pH of the suspension. At pH 5 the (I) deposits are largest at a low temperature and decrease rapidly with an increase, until at about 30°C. they reach a constant, low value. At pH 7, however, a maximum is reached in the temperature range between 30 and 50°. Tests including the additions of water-softening or surface-active agents have shown a slightly beneficial effect at various pH values; the practical value of this effect is hard to estimate. With regard to the influence of calcium ions on the amount of (I) deposited, no definite conclusions were reached. 4 tables, 7 figures, and 27 references.
E.S.

KOVALEV, V. P. The nature of pitch troubles. Bumazh. Prom. 25, no. 3: 20-25 (May-June, 1950). [In Russian]

On the basis of a series of titrations of acid-free water treated with resin compositions (i.e., oleic, palmitic, and stearic acids), as well as with rosin, it is stated that the carbonates and bicarbonates of alkali earth metals react with high-molecular weight resin acids to form insoluble calcium and magnesium salts, which cause pitch trouble. 5 tables and 5 figures, including 3 photomicrographs. E.G.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Empire State Section. Eastern District.* Pitch control. Tappi 35, no. 6: 117-20A (June, 1952).

In a panel discussion on pitch control, the following short papers were presented, listed by authors and titles: Jacques, Herbert F. Notes on the Diamond Match Co. pitch treatment, p. 117-18A; Moynihan, Robert. Can pitch in a paper mill be controlled? p. 118-19A; Linehan, D. D. Pitch control problems, p. 119A, and McCourt, Frank J., Jr. Pitch control, p. 119-20A. E.S.

PLASTIC FILMS—TESTING

BRUBAKER, DAVID WILLIAM, and KAMMERMEYER, KARL. Separation of gases by means of permeable membranes; permeability of plastic membranes to gases. Ind. Eng. Chem. 44, no. 6: 1465-74 (June, 1952).

The primary object of this study was the collection of data on the rate of gas permeation through a number of selected plastic membranes at different temperatures. The plastic films covered experimental and commercial films, and the basic film materials included most of the commercially important compounds. The effect of temperature was found to be not readily predictable, and it is recommended that permeability data be reported for at least two and preferably three temperatures. Although the temperature effect can in many cases be expressed by means of two parameters (i.e., the permeability at infinite temperature and the activation energy of permeation), the values of these parameters show such wide variations in magnitude for different gas-film combinations that it is considered impractical to use them as a ready means of characterization. The reporting of actual permeabilities is to be preferred. The effect of a plasticizer in the film formulation may or may not result in a uniform change of permeability. Both the amount and the type of plasticizer can produce pronounced changes in the permeability behavior of films. The proper choice of compounds and processing techniques should permit the development of films which have the desired gas-permeability characteristics. The significance of the reported data lies in their general applicability to the prediction of gas-separation characteristics; in addition, they are of considerable interest to users of plastic films for packaging purposes. 5 tables, 14 figures, and 28 references. E.S.

PLASTICS—HONEYCOMB

MAY, GEORGE. Plastics and the honeycomb structure. Brit. Plastics 25, no. 277: 201-5 (June, 1952).

The possible applications of resinated honeycomb structures are reviewed, including aircraft sections, flat panels, single and complex curvatures, furniture and buildings, air-freight packing cases, road vehicles, open honeycombs, and the packaging of small articles in the individual cells. The honeycombs may be produced from a variety of different materials (paper, fabrics, glass fiber, metal, wood, plastics, etc.) to serve in many fields; probably none is

more economical and has a wider scope than that made from resinated paper. 2 tables, 14 illustrations, and 11 references. E.S.

PRINTING AND PRINTER'S INK

ANDERSSON, ALF, and PIHL, L. Investigations of the drying of lithographic inks. Grafiska Forskningslaboratoriet Medd. no. 28: 3-15 (February, 1952). [In Swedish; English summary]

Samples of ink were taken from the ink ducts and the plate rollers of some offset presses. The samples taken from the rollers contained between 24 and 32% water, and the drying time was considerably longer than for the ink taken from the ducts. The effect of negative ions of the fountain solution on the drying rate was investigated, and it was found that phosphate, citrate, oxalate, and sulfate ions had a pronounced, unfavorable effect on the drying rate, whereas chromate and nitrate ions had very little or no influence. It was found that hydrolysis of the driers through the action of the fountain solution takes place. Experiments with various driers resulted in the development of a new type of drier which contains calcium perborate and which has an exceedingly strong, beneficial effect on inks emulsified with fountain solutions. 6 tables, 1 figure, and 2 references. E.S.

ANON. Printers' paper problems. XXVII. Maintenance of standards. Indian Print & Paper 17, no. 70: 39 (January, 1952); *cf.* B.I.P.C. 22: 618.

The methods are described by which a modern papermaker is endeavoring to match paper to a sample in repeat orders. The beneficial effects of standardization and laboratory tests are pointed out; although variations still occur, they are neither as great nor as frequent as they were only about 30 years ago (*cf.* B.I.P.C. 20: 421). E.S.

PURIFIED WOOD FIBER

MARTIN, M. Dissolving pulp developments. Can. Pulp Paper Ind. 5, no. 6: 8-9, 72 (June, 1952).

Following a short statistical resume on the consumption of rayon and acetate yarns in the United States and Canada during 1939-1950 and an outline of the technical processes involved, new developments in cooking, bleaching, and machinery in the manufacture of dissolving pulp are mentioned briefly, with reference to some installations at the Prince Rupert mill in British Columbia of the Columbia Cellulose Co. Ltd. E.S.

RAGS

ANON. Mummies made paper. Interchem. Rev. 11, no. 1: 18-19 (Spring, 1952).

Mention is made of the importation of mummies from Egypt into the United States in 1856 and during the Civil War for the sole purpose of stripping the dried bodies of their cloth wrappings and using the material in the manufacture of paper. The information is taken from Dard Hunter's "Papermaking," 2d ed., New York, Knopf, 1947, p. 382-5. 2 illustrations. E.S.

RESEARCH LABORATORIES

CROWN ZELLERBACH CORPORATION. "New research era for C-Z." Laboratory is dedicated. Pulp & Paper 26, no. 6: 38, 40, 42, 81

(June, 1952); Chem. Eng. News 30, no. 26: 2714-15 (June 30, 1952); Paper Ind. 34, no. 3: 332-3 (June, 1952); *cf.* B.I.P.C. 22: 745.

Illustrated descriptions of the new Development Laboratory of the Central Research Department are given; the articles are not identical. The first reference gives the most complete description. 7, 6, and 4 illustrations, respectively. E.S.

JENSEN, WALDEMAR. The activities at the Institute of Wood Chemistry at Åbo Akademi during 1951-52. Paper and Timber (Finland) 34, no. 4a: 157-9 (Special issue, April, 1952). [In Swedish; English summary] *cf.* B.I.P.C. 21: 871.

The report covers the appointment of W. Jensen as professor of wood chemistry and chemical engineering at Åbo Akademi, researches carried out during the period covered (particularly studies on the chemistry of birchwood), contact with other institutions, and the remodeling of the library. E.S.

SAFETY

SCHWEISHEIMER, W. Industrial workers on hot summer days. Pulp Paper Mag. Can. 53, no. 6: 192, 199 (May, 1952).

Adverse physiological reactions to excessive heat are described, and suitable air-conditioning measures, diet, and clothing are recommended. L.C.

ZWEILING, GÜNTER. The testing of pressure vessels. Das Papier 6, no. 9/10: 176-8 (May, 1952). [In German]

A resume of the German testing rules and specifications for portable and stationary pressure vessels is presented. E.S.

SEMI-CHEMICAL PULPING PROCESS

ADAMS, DANIEL O., and TENNANT, JAMES L., JR. Semichemical pulps—strength-sheet density studies. Tappi 35, no. 6: 58A, 60A, 62A (June, 1952).

Four soda and four kraft semichemical pulps were prepared from New England hardwoods in a laboratory Asplund-type defibrator. Yields were from 63 to 84.8% on an ovendry basis. These pulps were evaluated for use in flooring and roofing felts by laboratory beater studies. Handsheets were made at a basis weight of 40 pounds/480 sq. ft., a common saturating-felt weight. When the tear, tensile, and burst of these sheets are plotted against freeness, increasing strength with increased delignification is apparent. However, when the same strength properties are plotted against sheet density, the situation is more complex. The strengths of the unbeaten pulps are uniformly low, and their densities increase with decreasing yield. With beating, both sheet density and sheet strength increase. The slope of the strength *vs.* density curve is generally greater as the yield is decreased. Thus the strength *vs.* density curves at the various yields cross each other. There is a definite density range within which 5% sodium hydroxide gives maximum strength; in another range, 2.5% sodium hydroxide gives maximum strength, etc. At any given sheet density there appears to be a particular quantity of chemical which gives maximum strength sheets. More or less chemical used in cooking results in weaker pulps at the given sheet density. 2 tables, 7 figures, and 8 references. E.S.

CONVERSE, C. WILLIAM. Semichemical pulping—a process study. Tappi 35, no. 6: 50A, 52A, 54A, 56A, 58A (June, 1952).

Three commercial semichemical processes are described: the neutral sulfite, sulfate, and cold caustic processes; of these, the neutral sulfite is the only one to produce bleached pulp. Both rotary and vertical, as well as continuous digesters are used. The movement of the cooked chips to the refiner may be by mechanical methods or pumping. Refining is generally accomplished in disk refiners. The pulp may be washed and screened after which it goes to the paper or board mill. The neutral sulfite process is quite corrosive, and stainless steel should be used in contact with unwashed stock, especially when hot. Protection of the refiners from tramp iron is highly important. Semichemical pulp will soar much more quickly than fully cooked pulp; this characteristic should not be overlooked in the design of the system. 3 tables and 1 reference. E.S.

HUMBLE, I. Semichemical pulp in the United States. Svensk Papperstidn. 55, no. 9: 305-12 (May 15, 1952). [In Swedish]

The author gives an extensive review of the present procedures and equipment used in the manufacture of semichemical pulps in the United States. 1 table, 12 figures, and 33 references. E.S.

LEAVITT, E. M. Semichemical pulping using kraft liquor. Tappi 35, no. 6: 48A, 50A (June, 1952).

The flexible semichemical plant of the North Carolina Pulp Co. in Plymouth is described, which is a separate unit from the rest of the mill. The semichemical kraft process can be controlled by one operator and one helper from the operating floor. Hardwoods and pine are used, and all refined pine rejects from the kraft mill are added to the semichemical furnish for corrugating medium; the quality of the pulp is equivalent to that obtained with semichemical neutral sulfite pulping. Low chemical costs result from the use and recovery of kraft liquors; sewer losses vary from 5 to 10 lb. of salt cake/ton, and fiber losses are about 7 to 8 lb./ton. E.S.

MARTENY, W. W. Semichemical corrugating medium and the paper machine. Tappi 35, no. 6: 62A, 64A (June, 1952).

The author discusses the necessary adjustments in the operation of a Fourdrinier machine making corrugating medium from kraft and semichemical neutral sulfite pulps. The semichemical pulp requires a higher consistency in the headbox, and less flat suction boxes than the kraft pulp; it dries with greater difficulty and is more susceptible to tension in drying. It requires less calendering and has less strength in the wet web. E.S.

PANCIROLLI, FRANCESCO. Semichemical pulps. Ind. carta (Milan) 6, no. 5: 53-9 (May, 1952). [In Italian; French and English summaries]

The author discusses the different batch and continuous semichemical processes, suitable wood species, characteristics of the resulting pulps, and bleaching. The advantages, including high yields and the utilization of hitherto unused species and wood waste, are emphasized. 4 tables, 5 figures, and 14 references. E.S.

SAPP, J. E. Semichemical process flowsheets. Tappi 35, no. 6: 40A, 42A, 44A (June, 1952).

The status of semichemical pulping is reviewed, with particular emphasis

on the two major processes now in commercial use, the kraft and neutral sulfite processes. Flowsheets of several types of installations are given to show the principal kinds of equipment currently employed. 4 figures and 16 references. E.S.

YUNDT, A. P. Uniform cooking by a continuous semichemical process. Tappi 35, no. 6: 46A, 48A (June, 1952).

The author describes a 50-ton pilot-plant development at the Camp Manufacturing Co., in which uniform cooking of hardwood pulps by a semichemical kraft process is achieved. It consists of presteaming gum or oak chips at atmospheric pressure to expel the air, displacing the steam with a solution of cooking chemicals and soaking for four hours, draining the soaking liquor from the chips and fortifying it for re-use, introducing the drained chips into a conventional, continuous cooker by means of a rotary valve, and cooking and defibering in the conventional manner. The cooking time and temperature may be reduced, because penetration has already been accomplished; little force is required for defibering so that fiber damage is slight. By screening the pulp and refining the rejects, it is possible to make a shive-free pulp of over 700 ml. Canadian Standard freeness, which is suitable for paper towels or as an addition to grocery bags. No softwood-fiber addition is found necessary for corrugating medium, although 2% refined screening rejects from the kraft mill are added. 1 reference. E.S.

SETUP BOXES

FRA. Calculations for cardboard boxes. (XV). Allg. Papier-Rundschau no. 10: 459-61 (May 26, 1952). [In German] *cf.* B.I.P.C. 22: 691.

A sample calculation is presented of the cost (in Germany) of a fancy, covered setup box for perfume bottles, including a hinged, domed lid and covered bottom insert, die-cut to conform to the shape of the bottle. 2 tables and 1 illustration. E.S.

SHIPPING CONTAINERS

LYNN, A. G. [Containers] Tappi 35, no. 6: 116-17A (June, 1952).

The author discusses in a general way controversial points on corrugated and solid fiberboard containers, Fourdrinier and cylinder board, and kraft *vs.* jute board; in conclusion, reference is made to various characteristics of different corrugating mediums. E.S.

SHIPPING CONTAINERS—FIBER DRUMS

AMERICAN CYANAMID COMPANY. Drum extension. Modern Plastics 29, no. 10: 178 (June, 1952).

To obtain uniform distribution in drums of molding powder after shipping, stainless steel, cylindrical extensions are supplied by the company to be used with the Leverpak fiber drums in which they ship their urea and melamine molding compounds. The center of the fiber drum is first cut out, the extension is fastened in the hole, replacing the drum cover, and sufficient volume is thereby added so that efficient tumbling can be achieved without previously removing part of the contents. 1 illustration. E.S.

PACIFIC STEELFIBER DRUMS, *Alhambra, Calif.* Mandate for laminate. Chem. Week 70, no. 26: 40, 42 (June 28, 1952); Chem. Eng. 59, no. 7: 242 (July, 1952); *cf.* B.I.P.C. 22: 435.

A new fiber drum has been developed from inert, waterproof aluminum foil glued to 16-point kraft linerboard; the resulting lamination is wrapped continuously into a six-ply cylinder of the desired diameter. Sheet-steel tops and bottoms are attached with a patented seal in the chime. With a total of 12 laminated layers, the drum body compares favorably in strength and freedom from leaks with the steel sheeting normally used in single-trip drums; the big advantage of the new drums is reduction in weight and price. Field tests now in progress are principally directed at the petroleum-oil and lubricating-grease markets; the possible usage for any materials which require an inert, moisture- and vaporproof container is indicated. The current manufacture is on a pilot-plant scale; however, construction of plants in the East or the licensing of other producers is being considered. 2 illustrations. E.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

PACKAGING PARADE. One multiwall sack, same style, same printing, accommodates 77 different items. Packaging Parade 20, no. 233: 54-5 (June, 1952).

Honneggers' & Company, Inc., producer of feed and agricultural products, has adopted a colored and coded tag system which allows one style of bag to be used for 77 different products. Tags are stitched to the bags after filling. Processing before sacking, actual sacking, and labeling methods are described. 8 illustrations. L.C.

SHIPPING CONTAINERS—TESTING

ZUSI, CHARLES J. Evaluating case fatigue. Fibre Containers 37, no. 6: 74, 76, 81 (June, 1952); *cf.* B.I.P.C. 20: 202-3.

The term "fatigue" (I) as used in the testing of containers means the effect of the constant application to a box of a load less than the maximum load which the box would withstand in flat top-to-bottom compression. The ability of a fiber box to withstand piling loads is particularly significant at present when the national inventory of goods held in storage is at the highest point in history. Length of storage is a key factor in (I). No simple, quick way to determine the safe piling-load resistance of a warehoused container exists. In the present studies an attempt has been made to determine the effects of (I) in terms of the results of laboratory compression tests. A wide range of corrugated boxes, differing in component materials, flutes, and sizes, was included; all boxes were tested empty. They were arranged in a vertical pile, three high, on a level base with a carefully balanced load placed on top. To accelerate the completion of the tests, it was necessary to increase the top loads on the piles in accordance with an established program. A stability factor for each lot of boxes was calculated, although the tipping tendency of the boxes was found to have no effect upon (I). The effect of various other factors was studied, including changes in the materials of which the boxes were made (kraft or jute); the kind of corrugating medium used in the wall, whether A, B, or C flute (all corrugations were vertical); and the size of the box, more particularly the perimeter of the top and bottom faces. More important than any of these factors was that of the efficiency with which the boxes were fabricated; however, the most influential factor of all was the relative humidity of the storage atmosphere. Any atmosphere of greater than 50% R.H. accelerated the effects of (I) to a surprising extent. Although over 500 piles of boxes were tested, the investigation is by no means complete, and many more tests with the various factors better controlled must be carried out before definite, final conclusions can be drawn. A distinct difference between the test conditions at the Forest Products Laboratory (*cf.* B.I.P.C. 22: 202-3) and those of the present study was that the former were tested one at a time, whereas in the latter case they were ar-

ranged in piles three high; the conclusions to be drawn from the second series of tests would indicate definitely lower safe-storage loads. 4 figures.
E.S.

SLIME PREVENTION

NEWLAND, STEWART H. Application of chlorine in the control of microbiological organisms in process waters. Am. Dyestuff Reptr. 41, no. 13: 392-7 (June 23, 1952).

Chlorination as a part of the process of purifying water for textile purposes performs two functions: it controls slime-forming organisms and it destroys organic matter, which colors many New England waters. The chlorine residual in water, the chlorine remaining after treatment, is of two types: that combined with nitrogen as chloramine and that present as active, or uncombined, chlorine. The author points out that it is hypochlorous acid which destroys slime-forming organisms, and the hypochlorous acid concentration is dependent upon both active-chlorine residual and pH. The addition of chlorine to water for the control of slime organisms is explained. The various types of organisms that are involved in slime formation, including algae, fungi, and bacteria, are discussed. Iron and sulfur bacteria are especially to be avoided in water for textile uses. 21 figures. E.S.

SPECIFICATIONS

THIEM, MERRITT C. Government fibre box specifications. Fibre Containers 37, no. 6: 88, 90, 92 (June, 1952).

The author discusses the important sections of Federal specifications LLL-B-631c (corrugated boxes for domestic shipment) and LLL-B-636c (solid fiber boxes for domestic shipment) and Joint Army-Navy specification JAN-P-108 which covers both corrugated and solid boxes for overseas shipment, with particular reference to those sections which in the past caused some questions to be raised in the field. E.S.

SPENT SEMICHEMICAL LIQUOR

LOGAN, K. C., and PURVES, C. B. Electrochemical recovery of sodium base and of acid from sulphite waste liquor. Tappi 35, no. 6: 284-8 (June, 1952).

Although the neutral sulfite process for pulping woods has many merits, a practical method of recovering the expensive sodium base is not yet available. The present article deals with laboratory-scale experiments in which over 90% of the sodium was recovered, as nearly pure caustic soda of up to 2% concentration, by electrolyzing the spent liquor in a cell with a porous clay diaphragm and a nickel cathode. Electrical efficiencies ranged up to 70% in a four-stage electrolysis, and the average value of 55% corresponded to the consumption of about 2.2 kw.-hr. per pound of caustic soda recovered. The oxidation of purified, carbohydrate-free sodium lignosulfonate was studied under strongly alkaline conditions in a cell with a copper anode and no diaphragm. Part of the sulfonic acid group was released as sulfuric acid; oxalic acid dihydrate up to 16% by weight was the only other acid identified. The production of the dihydrate required about 13.4 kw.-hr. per pound. The economic implications of the above results are discussed briefly. 4 tables and 24 references. E.S.

STAINS AND STAINING

GREEN, H. V., and YORSTON, F. H. Identification of unbleached sulphite pulps in mixtures. Pulp Paper Mag. Can. 53, no. 6: 133-4 (May, 1952).

The authors describe a new specific stain for unbleached coniferous sulfite fibers, which does not stain groundwood, unbleached kraft, bleached kraft, bleached sulfite, nor (as a rule) unbleached hardwood sulfite. The preparation of the stain (*p,p'*-azodimethylaniline), its application to the microscopic analysis of fiber mixtures, and the examination of fiber orientation in paper are outlined. Other applications are suggested. 1 figure and 5 references. E.S.

PICHETTE, A. H., and YORSTON, F. H. The determination of unbleached sulphite pulp in newsprint. Pulp Paper Mag. Can. 53, no. 6: 130-2 (May, 1952).

The percentage of unbleached sulfite in any newsprint sheet can be determined, with a basic accuracy of 1%, by staining it with *p,p'*-azodimethylaniline under standard conditions, stripping the stain thus taken up, determining the amount colorimetrically, and reading off the percentage of unbleached sulfite from a graph drawn up from results on known mixtures of similar pulps. This method has possibilities for mill use, provided that the sulfite furnish is reasonably uniform as to chlorine number. The relationship between the amount of stain taken up, and the percentage content of unbleached sulfite of a given chlorine number, is essentially linear. The relationship between the amount of stain taken up at a given percentage of sulfite, and the chlorine or permanganate number of the sulfite is also linear. 3 tables, 2 figures, and 3 references. E.S.

STARCH

LEWIS, FLOYD A. Expanded use of corn products in paper making. Paper Ind. 34, no. 3: 350-6 (June, 1952).

The use of cornstarch as a beater additive, in surface sizes, as a binder for clay or pigment coatings, and as adhesives for envelopes, bags, boxes, drinking cups, food containers (including paper-milk bottles), and similar applications is described. 15 illustrations and 2 references. L.E.W.

NUSSENBAUM, S., and HASSID, W. Z. Mechanism of amylopectin formation by the action of Q enzyme. J. Biol. Chem. 196, no. 2: 785-92 (June, 1952).

Linear dextrins of average chain length up to approximately 42 glucose units are not utilized by the Q enzyme of potato for the synthesis of branched amylopectin, whereas dextrins of 116 unit average chain length are converted by this enzyme to amylopectin. It appears that a dextrin of a certain minimum chain length, somewhere between these two values, must be available before the Q enzyme is able to act on it in the formation of a branched polysaccharide. When the reaction of the Q enzyme with amylose is arrested after short periods of incubation, the synthetic polysaccharides appear to have structures intermediate between those of amylose and amylopectin. This indicates that during the course of conversion the action of the Q enzyme on the amylose molecules is random. The molecular weight of the polysaccharide produced by the action of Q enzyme on amylose gradually decreased as the reaction progressed. The decrease is attributed to an α-amylase impurity or a debranching enzyme present in the Q enzyme preparation. 2 tables and 15 references. E.S.

STATIC ELECTRICITY IN PAPER

BÜTTNER, MARTIN. De-electrification of the paper web. Das Papier 6, no. 9/10: 184-5 (May, 1952); Wochbl. Papierfabr. 80, no. 10: 318 (May 31, 1952). [In German]

A high-frequency generator (which furnishes high voltages with very low current intensities through suitable electrodes) serves to ionize the air surrounding the moving sheet, thus freeing it from static electricity. The equipment occupies little space and presents no hazards. 1 illustration in the first reference. L.E.W.

STATISTICAL METHODS

SCHAFFRATH, P. M. The use of statistical methods in research. Tappi 35, no. 6: 246-9 (June, 1952).

The purpose of this paper is an attempt to present, as briefly and in as nontechnical a manner as possible, some of the statistical methods available to the research worker in the pulp and paper industry and to demonstrate some of the advantages which may be gained through the use of a few of these techniques. 1 table. E.S.

TRELFA, R. T. Application of statistical methods in the coating plant. Tappi 35, no. 6: 254-7 (June, 1952).

The application of statistical methods to problems of routine control and to specific investigations is discussed. Actual problems arising in the paper coating plant which were solved by statistical methods illustrate the scope and value of these techniques. A problem of routine control arose in a plant in connection with the visual inspection of coated paper for defects. Charting and weighting of visual defects on a "go-no go" basis was used for control and evaluation. Testing personnel recorded their observations on a control chart which gave a continuous record of product quality and the steps taken to remedy defects. The results of this program were a marked improvement in coated paper quality and considerable savings. A problem for statistical investigation arose in an attempt to determine the cause of "brushiness" in coated papers. Data relating the "plasticity index" of the coating material and quality of the coated paper were subjected to statistical analysis. The plasticity index was found to have a significant effect on brushiness, and an optimum value for the plasticity index was established. The incidence of brushiness was reduced to one third its former value. 2 tables, 2 figures, and 7 references. E.S.

STEAM POWER

BROLA, G. Forced-circulation steam generator. Bull. assoc. tech. ind. papetière 6, no. 2: 33-43 (May, 1952). [In French]

A forced-circulation steam generator is described which is capable of producing seven tons of superheated steam per hour at 120-130°C. under 2 kg./sq. cm. pressure. The generator, which is adapted for use in industrial heating, possesses the advantages of small space requirement and flexibility of operation. 7 figures. E.G.S.

STREAM POLLUTION

RUDOLFS, WILLEM, and NEMEROW, N. L. Rag, rope, and jute wastes from specialty paper mills. III. Chemical treatment of rope cook liquor. Sewage Ind. Wastes 24, no. 6: 764-7 (June, 1952); *cf.* B.I.P.C. 22: 774.

A study of various methods of chemical treatment of rope wastes showed that, in general, most of the coagulants which caused good clarification also produced excessive quantities of sludge and effected relatively little B.O.D. reduction. A three-stage chemical treatment with ferric chloride, sulfuric acid, and alum in separate, successive stages resulted in a total B.O.D. reduction of 50% and a total sludge volume of 27% of the original waste, with

a turbidity reduction of greater than 82% and a practically colorless effluent. All other single or combined chemical coagulants investigated produced lower B.O.D. reductions. 1 diagram and 2 references. E.S.

SULFATE MILLS

PAPER MILL NEWS. Riegel Carolina's N. C. mill operating. Paper Mill News 75, no. 25: 10-12, 14, 16, 18, 20, 22, 32 (June 21, 1952); *cf.* B.I.P.C. 21: 193.

The new 200-ton bleached sulfate-pulp mill of the Riegel Carolina Corp. at Acme, N.C. has now been in operation since the beginning of 1952. An illustrated description of the installations is given. The unique feature of this mill is its flexibility; two types of pulp (straight kraft and semichemical) can be cooked and processed at the same time. The six-stage Improved Paper Machinery bleach plant has a capacity of 200 tons per day. Other unusual features include a Ross air drier, the third of its type installed in this country, with a length of about 146 feet, followed by a cooling section which reduces the pulp temperature before cutting and baling, and a wet-bottom electrical precipitator supplied by Research Corp. The power plant includes three boilers, one power boiler for pulverized fuel, one recovery boiler, and one bark boiler. Pulpwood (pine and gum) is transported by rail and truck from company timber holdings and privately owned woodlands. 18 illustrations of the equipment. E.S.

SULFITE MILLS

ANON. Alaska work begins. Pulp & Paper 26, no. 6: 26, 28 (June, 1952); *cf.* B.I.P.C. 22: 121.

Orders have been placed for most of the equipment for the new magnesium-base sulfite mill of the Ketchikan Pulp Co. with a planned capacity of 300 tons of dissolving pulp daily. Actual construction began in May, 1952, and the mill is to be completed in June, 1954. It will involve a great deal of unusual equipment, including a Rice Barton Fourdrinier machine for either paper or pulp, stainless-steel lined digesters, and two magnesium oxide recovery boilers. 1 map and 2 illustrations. E.S.

SULFITE PROCESS

ELIASHBERG, M. G. Advances in the chemistry of sulfite cooking. Bumazh. Prom. 25, no. 3: 6-9 (May-June, 1950). [In Russian]

A brief review is devoted to developments in the chemistry of the sulfite process, including the work of Adler, Calhoun, Hägglund, Kullgren, and others. 11 references. E.G.S.

MILOV, B. G., and ROZANOV, S. YA. Process control in cooking pulp. Bumazh. Prom. 25, no. 1: 6-10 (January-February, 1950). [In Russian]

A discussion is given of pH variation during sulfite cooking and of the effect of final pH on pulp viscosity and hardness (Björkman number). Two process-control methods are described—one involves the determination of the color of the liquor, and the other, the use of indicator paper. 4 figures. E.G.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Standard terms used in the sulphite pulping process. Tappi 35, no. 6: 135A (June, 1952).

This is a revision of TAPPI Tentative Standard O 406 p-49, which was changed in 1952 to O 300 p. The change from "sulfite waste liquor" to "spent sulfite liquor" is included. E.S.

SULFITE WASTE LIQUOR

JENSEN, WALDEMAR, and RINNE, PEKKA. Investigation of the fusel oil obtained in the production of alcohol from spent sulfite liquor. II. Paper and Timber (Finland) 34, no. 4a: 137-9 (Special issue, April, 1952). [In Swedish; English summary] *cf.* B.I.P.C. 21: 353.

Fusel oil obtained in the production of alcohol from spent sulfite liquor in 15 mills in Finland has been analyzed by distillation in a spinning-band column designed by Björkman and Olavi (*cf.* Svensk Kem. Tid. 58: 145-50 [1946]); the results are presented in a table and show quite large variations, although the general trends are similar. Every sample of fusel oil was distilled before and after drying. The water was removed by treating the oil successively with ignited sodium sulfate and magnesium nitride. Four examples of distillation curves obtained in these experiments are included. In one case the chemical constitution of each fraction was checked after redistillation by determining the specific weight, elemental composition, molecular weight, hydroxyl number, and optical activity. In all other cases the fractions were classified according to their boiling points. The percentages of identified compounds listed in the table have been calculated from the horizontal distances between the mid-points of the vertical sections of the distillation curves. 1 table, 4 figures, and 7 references. E.S.

SURFACE AREA

BARRER, R. M., MACKENZIE, N., and MACLEOD, D. The adsorption method of measuring surface areas. J. Chem. Soc.: 1736-44 (May, 1952).

To investigate the accuracy of the adsorption method of measuring surface areas, a group of Brunauer, Emmet, and Teller (B.E.T.)-type multilayer isotherms has been derived, and examined by use of experimental sorption data obtained on montmorillonite and attapulgite. In the isotherms, the volatility of sorbate molecules was assumed to increase the higher the layer in which they were situated. This has the effect of reducing the excessive sorption given at higher relative pressure by the original B.E.T. equation. A number of the isotherms were in good agreement with the experimental data, and the v_m values derived from each of the successful isotherms were in satisfactory agreement. It is suggested that the adsorption method can in this case be a good absolute measure of surface area. If, as is quite often true of the original B.E.T. or Huttig equations, the isotherm fit is not good, values of v_m are less consistent, and it is then considered that surface areas as determined by the adsorption method may not be accurate. 3 tables and 4 figures. E.S.

TALL OIL

KHUDOVEKOV, V. D., and KARTSEVA, M. V. Improving the recovery of sulfate soap. Bumazh. Prom. 25, no. 2: 30-2 (March-April, 1950). [In Russian]

The methods for the recovery of sulfate soap which were investigated included flotation, settling at 40°C., and settling at 20° for 48 hours, in ethyl ether and petroleum ether. It was found that flotation provided yields which

were 25-45% greater than those obtained with settling at 40°, and 15-20% greater than at 20°. 2 tables. E.G.S.

THIXOTROPY

THOMPSON, R. N. An explanation of "tackypknosis." J. Phys. Chem. 56, no. 6: 766-7 (June, 1952).

It has been shown that the equilibrium torque measured by a rotational-type viscometer on a thixotropic system is a function of the rate of shear and the amount of thixotropy in the system at that rate of shear. There will be a definite equilibrium torque for each shearing rate, and these torques will only approach one another as the difference between the rates of shear approaches zero. The phenomenon which Van Wazer and Besmertnuk (*cf.* B.I.P.C. 20: 554) chose to call "tackypyknosis" is really not a distinct phenomenon. It is thixotropy and should be recognized as such. 3 tables and 2 references. E.S.

TURPENTINE

DUSENBURY, M. R., and REESE, JOHN E. Some observations on sulphate turpentine recovery. Southern Pulp Paper Manuf. 15, no. 6: 40 (June, 1952). [Abridgment]

Directions for the installation of an efficient recovery unit for sulfate turpentine (I) including a continuous decanter are given. (I) is quite corrosive, particularly in the vapor phase; the addition of 0.25% of aqueous ammonium hydroxide to (I), especially to storage tanks and tank cars, has been found successful in preventing corrosion. 2 tables and 3 figures. E.S.

VIBRATION

SUKHOPAROV, A. A. Dynamic balancing of papermaking equipment. Bumazh. Prom. 25, no. 3: 25-9 (May-June, 1950). [In Russian]

A vibration meter is described which is particularly adapted for use in the balancing of papermaking machinery. The application of the instrument in the correction of bearing vibration is shown. 9 figures. E.G.S.

VISCOSITY

STEINMANN, R., and TROMM, GÜNTHER. Representation of the dependency of the factors essential for the measurement of structural viscosity. Reyon, Synthetica, Zellwolle 29, no. 12: 488-91 (December, 1951). [In German]

A diagram has been constructed in which the mutual relationship of the six most important factors (viscosity coefficient, volume of flow, radius and length of the capillary tube, shear stress, and pressure) in the measurement of structural viscosity is indicated. 2 figures and 1 reference. E.S.

WAXES

STEINLE, J. VERNON. Wax chemurgy in the U. S. Chemurgic Digest 11, no. 6: 4-5 (June, 1952).

Various native vegetable waxes are discussed, and their sources, processing, and uses are considered. L.C.

WHITE WATER

BARTON, C. C. Clarification of effluent by settling; experiences at Fairfield. Australian Pulp & Paper Ind. Tech. Assoc., Proc. 5: 132-42; discussion: 143-5 (1951).

The effluent from a plant comprising one board mill and two paper mills has been treated in the laboratory and the mill plant for clarification with chemicals. Alum, alum and Sveen glue, alum and acid, acid alone, and ferric chloride were tried in the laboratory. Alum was the most satisfactory performer considering all aspects, although the addition of glue afforded some improvement. Alum was added at the main effluent tank, effecting sufficient clarification to permit the re-use of the water in all sprays of the board machine. A considerable saving was achieved, especially on higher-grade board. 4 figures and 5 references. E.S.

MACLEAN, N. Some interesting facts about backwater. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 29, no. 2: 58-64 (April, 1952).

The author describes the results of routine consistency tests on white water obtained on machines producing principally wood-free papers; he confines his remarks to fiber and fillers and disregards the build-up of materials such as starch and alum. The tremendous volume of water which leaves the machine between the breast and couch rolls contains valuable fiber and fillers; the total solids in the white water are expressed as a percentage of the solids passing on to the wire in a given period and are called the through factor (I), which can be divided into the fiber (I) and the mineral (I). Some variables that might be expected to influence the (I) are: the basis weight being run, the nature and characteristics of the stock, the amount of loading, the temperature and pH of the stock, the consistency at the breast roll, the speed of the machine, and the wire itself and the length of the forming table. The results obtained in the study of these variables are discussed and tabular data on the effect of basis weight, fillers, and furnish on (I) are given. With regard to the proportion of tray and suction water, the general figure is trays, 75%, and suction boxes, 25%, whereas on greaseproof papers, the tray water was found to represent only two thirds of the total. On machines which possess more than one tray, the volume handled by each tray normally represents a progressively smaller proportion of the total. The percentage solids content of the white water decreases as the sample is taken further along the wire. However, on running pattern tissue (the lightest basis weight produced by this mill), the highest concentration of white water was found at the suction boxes. In conclusion, practical applications of these data are discussed, including the correct re-use of the richest white water, the determination of the adequate capacity of dirt removal installations and of suction pumps, and the actual retention of fillers on the wire. 5 tables and 4 references. E.S.

WOOD—CHEMISTRY

CLERMONT, L. P., and SCHWARTZ, H. The chemical composition of Canadian woods. II. Pulp Paper Mag. Can. 53, no. 6: 142-3 (May, 1952); *cf.* B.I.P.C. 22: 445.

Additional proximate and summative analyses of the following Canadian wood species are given: red pine (*Pinus resinosa*), tamarack (*Larix laricina*), basswood (*Tilia americana*), white elm (*Ulmus americana*), black ash (*Fraxinus nigra*), yellow birch (*Betula lutea*), beech (*Fagus grandifolia*), and sugar maple (*Acer saccharum*). 3 tables and 2 references. E.S.

WOOD—SACCHARIFICATION

DESFORGES, J. Hydrolysis of wood by the process of A. Hereng. Chimie et industrie 67, no. 5: 753-60 (May, 1952). [In French]

After discussing briefly the more common industrial processes used in hydrolyzing wood by means of dilute and concentrated acids, the author gives a rather detailed description of the Hereng method, which uses wood or agricultural wastes and cold hydrochloric acid in a continuous process at atmospheric pressure. The gradual hydrolysis is effected in a single polyvinyl chloride tower which contains a series of sloping baffles. The wood and 30-33% acid enter at the top of the tower, and the mixture is gradually led to the bottom of the bank of diffusers where the acid is enriched with gaseous hydrogen chloride. Hemicelluloses are hydrolyzed first, and the enriched acid permits later hydrolysis of the cellulose. Inasmuch as the initial temperature of the reaction is about 10°C. and the sugars are not destroyed below 30°, the method should be profitable, especially in France. A detailed schematic sketch shows the equipment and indicates how the lignin, hydrochloric acid, sugars, and acetic acid are separated from each other and how the hydrochloric acid is regenerated and dehydrated. The sequence of operations which are in the main automatic and require relatively little attention is also considered. Unlike other processes, the present one appears to be economical even when the tonnage of the plant is relatively small (*cf.* also U. S. patent 2,474,669 [June 28, 1949]). 1 table and 5 figures. L.E.W.

WOOD OPERATIONS

ANON. New small log handling methods for Pacific Coast. Paper Trade J. 134, no. 23: 14 (June 6, 1952); Paper Ind. 34, no. 3: 320 (June, 1952).

The Meighan hook and its use in bundling relogging and salvage material are described. 2 illustrations. E.S.

COMPLIN, E. R. Employee relations in the woods. Pulp Paper Mag. Can. 53, no. 6: 159, 161-2 (May, 1952).

The author discusses high labor turnover among lumberjacks during the operating season and recommends stabilization of the labor force through more permanent camp sites and better labor-management relations through a foreman training program. L.C.

WOOD ROOM

ANON. New efficient wood room in operation at O & M. Southern Pulp Paper Manuf. 15, no. 6: 38 (June, 1952).

A brief description of the facilities in the new woodroom at Fort Frances of the Ontario-Minnesota Pulp and Paper Co. is given; it includes four 12 × 45-foot barking drums with provisions for a fifth, in case future demands require it. The removed bark is sluiced to the bark-preparation plant in the old woodroom where it is pressed prior to burning. 2 illustrations. E.S.

WOOD TRANSPORTATION

ANON. New wood handling; Gaylord mill's improved process. Pulp & Paper 26, no. 6: 30-1 (June, 1952); *cf.* B.I.P.C. 18: 690-1.

The new pulpwood handling and preparation system of Gaylord Container Corp. at Bogalusa, La. is described, including a flume supplied with water

by two pumps which carries the logs from the unloading points to the barkers. Trucks unload directly by backing up and rolling the logs off, whereas an overhead crane with grapple lifts the pulpwood from railroad cars and drops it into the flume. 8 illustrations. E.S.

WOOD WASTE

HEIKINHEIMO, OLLI. Observations of the wood waste industry in the U. S. A. Paper and Timber (Finland) 34, no. 4a: 168-82, 184-9 (Special issue, April, 1952). [In Finnish; English summary]

An extensive review of wood-waste utilization in the United States is presented, with particular reference to the manufacture of wood briquets and fiberboards, including wet-strength treatments. 5 tables and 16 figures. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

KOENIG, JOSEPH J., ERSKINE, FRANK G., and MCMANUS, ALBERT R. Water-insoluble adhesive composition. U. S. patent 2,597,006. Filed Aug. 13, 1948. Issued May 20, 1952. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 106-154]

A homogeneous, aqueous, fast-setting, stable, smooth-spreading, laminating adhesive composition which is adapted for the bonding and lamination of two or more sheets of paperboard to form solid fiberboard, as used in the manufacture of "V" boxes, comprises the following ingredients: 665 gallons of water at 85-90°F., 1800 pounds of clay, 1600 pounds of isolated soybean protein, and 128 pounds of potassium hydroxide in 50 gallons of water. The resulting composition has a pH of 10.5-10.7, and the size of all solid components is less than 45 microns. If desired, sodium pentachlorophenate may be incorporated as a preservative, and pine oil may be added to enhance the spreading and flowing characteristics of the material. 1 figure. E.G.S.

ALKALINE PROCESSES

MILLER, HUGUENIN. Alkaline pulping of preimpregnated deciduous wood. U. S. patent 2,599,572. Filed Feb. 1, 1946. Issued June 10, 1952. 3 claims. Assigned to Watervliet Paper Company. [Cl. 92-13]

A process for the pulping of deciduous wood chips (e.g., aspen) consists in impregnating the chips with a 2-6% sodium hydroxide solution in a closed vessel; heating the vessel sufficiently to raise the temperature of the chips to about 10°F. above the boiling point of water at atmospheric pressure plus the hydrostatic head on the submerged chips; venting the vessel intermittently during the heating process; rapidly blowing the vessel to atmospheric pressure; soaking the chips to complete their impregnation; drawing off the excess impregnating solution; immersing the impregnated chips in an aqueous lime suspension; cooking the immersed chips in an excess of lime at 212-450°F. for a sufficient time to render the fibers readily separable by mechanical means without reducing the lignin content of the wood; and washing and mechanically separating the fibers. E.G.S.

MILLER HUGUENIN. Pulping wood with sodium carbonate-lime solution. U. S. patent 2,599,571. Filed Jan. 16, 1946. Issued June 10, 1952. 2 claims. Assigned to Watervliet Paper Company. [Cl. 92-13]

This is substantially the same process as that described in U. S. patent 2,599,572 (see above), with the exception that a 3-8% sodium carbonate solution is used in place of a 2-6% sodium hydroxide solution. E.G.S.

BARK

NESTLE, ALFRED C. Drilling fluid. U. S. patent 2,601,050. Filed Sept. 15, 1948. Issued June 17, 1952. 28 claims. Assigned to Texaco Development Corporation. [Cl. 252-8.5]

A water-base drilling mud contains a seasoned or weathered crude oil; a mixture of the cork, bark-fiber, and bark-powder fractions of Douglas-fir bark; and sodium carboxymethylcellulose. E.G.S.

BARKERS AND BARKING

CLARK, JAMES R., and ADAMS, SPENCER M. Bark-removing apparatus comprising rotor and stationary cage. U. S. patent 2,599,090. Filed May 4, 1950. Issued June 3, 1952. 7 claims. [Cl. 144-208]

A barker comprises a stationary cylindrical cage structure which is rigidly mounted on a suitable base and held against rotation. The cylinder is provided with a rough inner surface, and a rotor which is mounted within the cage has radial arms dividing the interior space into peripherally open compartments, each of which is adapted to receive a charge of logs to be barked. Upon rotation of the rotor the logs are forced to move around the inner periphery of the cage, and even though each compartment is filled to capacity, such relative movement is enforced. The logs are thrown against the surface of the cage and each other, thereby producing the abrading necessary for bark removal. 3 figures. E.G.S.

EKHOLM, ERIK, and HANER, VICTOR C. Log supporting and log manipulating device for wood debarking devices. U. S. patent 2,600,625. Filed May 26, 1947. Issued June 17, 1952. 3 claims. Assigned to Puget Sound Pulp and Timber Co. [Cl. 144-208]

A mechanical barker includes means for handling logs to which limbs are still attached and for barking the limbs as well as the logs themselves. 3 figures. E.G.S.

WILLIFORD, JAMES K. Debarking machine having staggered flail-carrying drums for broadside attack on rotating logs. U. S. patent 2,599,962. Filed Sept. 22, 1950. Issued June 10, 1952. 9 claims. [Cl. 144-208]

An automatic mechanical barker includes means for rotating a log which do not interfere with the continuous forward movement of the log through the machine. The machine is designed to accept logs of varying diameter without adjustment. 6 figures. E.G.S.

BLEACHING—GROUNDWOOD

MCEWEN, ROBERT L., and SHELDON, FRED R. Bleaching or brightening a web of mixed fibers. U. S. patent 2,598,580. Filed

Oct. 8, 1947. Issued May 27, 1952. 2 claims. Assigned to Buffalo Electro-Chemical Company, Inc. [Cl. 92-1]

A method is described for the peroxide bleaching of a web or sheet which has a high groundwood content. This is similar to Canadian patent 461,241; *cf.* B.I.P.C. 20: 282. The U. S. patent specifies the admixture of bleached groundwood and sulfite pulp and the bleaching of the resultant mixture with an aqueous solution of hydrogen peroxide and a water-soluble phosphate. E.G.S.

BOARD—COATED

SHERMAN, ROBERT A., and CARLISLE, LUTHER O. Paper coating apparatus. U. S. patent 2,599,947. Filed Jan. 21, 1950. Issued June 10, 1952. 2 claims. Assigned to A. E. Staley Manufacturing Company. [Cl. 118-118]

A coating machine which is particularly adapted for the application of colored starch-clay coatings to paperboard embodies a wire-wrapped smoothing roll which is rotated by a variable-speed drive in a direction opposite to the travel of the paper web. 3 figures. E.G.S.

BOARD, BUILDING

RIDDELL, WALLACE C., and KIRK, GEORGE B. Water repellent gypsum product and process of making same. U. S. patent 2,597,901. Filed Aug. 31, 1950. Issued May 27, 1952. 20 claims. Assigned to Henry J. Kaiser Company. [Cl. 154-45.9]

A water-repellent gypsum wallboard comprises a gypsum core disposed between fibrous liners. The core consists of a set mass of gypsum crystals protectively coated with 1-2% of uniformly dispersed precipitated calcium rosin soap and 5-10% of residual fuel oil. Increased water repellency of the product is obtained by the addition of a dispersing agent (e.g., spent sulfite liquor or lignosulfonic acid) to the aqueous slurry of calcined gypsum from which the core is formed. 1 figure. E.G.S.

BOARD, FIREPROOF

WILSON, IVAN V., and MAROTTA, RALPH. Fire-retardant compositions. U. S. patent 2,600,455. Filed Aug. 31, 1950. Issued June 17, 1952. 13 claims. Assigned to Monsanto Chemical Company. [Cl. 260-6; changed to 260-17.3]

A fire-retardant coating composition which is applicable to wood, fiberboard, acoustical tile, and the like comprises a water-dispersible, heat-convertible urea-formaldehyde condensation product; a reaction product of phosphorus pentoxide and ammonia which is insoluble in cold water; and a mixture of hydrolyzed and unhydrolyzed starch. E.G.S.

BOARD, WET-STRENGTH

GILLESPIE, WILBUR F. Paperboard product and process for making same. U. S. patent 2,601,114. Filed Jan. 8, 1949. Issued June 17, 1952. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 154-138; changed to 154-100]

A rosin-sized combined board has a wet Mullen strength which is at least 50% of its dry strength, and an outer surface which is highly resistant to abrasion or scuffing under both wet and dry conditions and possesses good

printing properties. The board is suitable for use in re-usable beer cases and the like. 2 figures. E.G.S.

BOARD SPECIALTIES

ACKER, RALPH E. Corner locking construction for paperboard containers. Canadian patent 483,572. Filed Nov. 5, 1948. Issued May 27, 1952. 3 claims. Assigned to Container Corporation of America.

This is the same as U. S. patent 2,573,379; *cf.* B.I.P.C. *22*: 292. E.G.S.

GUYER, REYNOLDS, and HENNESSEY, RUSSELL J. Carrier package. U. S. patent 2,598,051. Filed Feb. 2, 1951. Issued May 27, 1952. 8 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-52]

A carrier carton for canned beer and the like embodies a slot or hole in its upper panel which serves as a handhole for carrying. 5 figures. E.G.S.

HOY, EDWARD W. Display stand. U. S. patent 2,597,731. Filed Nov. 13, 1946. Issued May 20, 1952. 8 claims. Assigned to Forbes Lithograph Manufacturing Company. [Cl. 211-135]

A collapsible cardboard display stand is provided with a tiered shelf which interlocks with the side walls of the stand. 5 figures. E.G.S.

KANTY, CHARLES L. Locking device for box covers. U. S. patent 2,598,558. Filed Feb. 10, 1950. Issued May 27, 1952. 1 claim. [Cl. 229-33]

An elongated, rectangular box which embodies a cellophane-covered display window is provided with a locking tab which is inserted between one edge of an end of the box and the adjacent side of the box. 6 figures. E.G.S.

KEITH, MARGARET W. Carrier for containers. U. S. patent 2,598,920. Filed April 12, 1949. Issued June 3, 1952. 9 claims. [Cl. 229-28]

A slidable handle for a collapsible paperboard bottle carrier is so related with respect to the carrier as to restrict the permissible movement of the handle within a line of travel and to provide several points of support between the handle and the carrier at the limit of outward motion of the handle from the carrier. 13 figures. E.G.S.

PHIPARD, HARVEY F., Jr. Display card for taped screws. U. S. patent 2,599,011. Filed Nov. 15, 1949. Issued June 3, 1952. 2 claims. Assigned to Research Engineering & Manufacturing, Inc. [Cl. 206-79]

A display card for a set of taped screws comprises a cardboard backing sheet provided with a series of slots into which the tops of the shanks of the taped screws may be fitted and held. 5 figures. E.G.S.

RUSSELL, HAROLD C., and KING, WILLIAM N. Process of making disintegratable top shot wads. U. S. patent 2,599,943. Filed Dec. 6, 1948. Issued June 10, 1952. 2 claims. Assigned to Federal Cartridge Corporation. [Cl. 117-155]

A continuous process is adapted for the manufacture of disintegrating top shot wads (for use in shot shell construction) from urea-formaldehyde resin-impregnated paperboard. E.G.S.

SIMONSEN, PETER H. Structure for supporting folded garments within a transportation container. U. S. patent 2,597,904. Filed Nov. 1, 1950. Issued May 27, 1952. 14 claims. [Cl. 206-7]

A cardboard garment hanger is designed to hold a suitcoat securely against shifting about within a shipping container or other box. 10 figures. E.G.S.

STEARN, WILLIAM T. Yarn package support. U. S. patent 2,597,960. Filed Oct. 18, 1950. Issued May 27, 1952. 8 claims. Assigned to Celanese Corporation of America. [Cl. 242-122]

A cone tube for a yarn package is formed from a tapered, tubular blank of paper or the like and is provided with a rigid end which is highly resistant to crushing. 2 figures. E.G.S.

TURNER, WILLIAM E. Carton with easel-forming closure member. U. S. patent 2,598,149. Filed Dec. 19, 1949. Issued May 27, 1952. 6 claims. Assigned to O. B. Andrews Company. [Cl. 206-45.22]

A carton is formed with a display opening in its front wall in combination with a hinged cover convertible to an easel. 6 figures. E.G.S.

CHLORINE DIOXIDE

WAYMAN, MORRIS, and RAPSON, WILLIAM H. Method for producing chlorine dioxide. U. S. patent 2,598,087. Filed June 2, 1949. Issued May 27, 1952. 5 claims. Assigned to Canadian International Paper Company. [Cl. 23-152]

An apparatus and process are adapted for the continuous production of chlorine dioxide by the reaction between sulfur dioxide and an aqueous solution of a metallic chlorate (e.g., sodium chlorate) under parallel or countercurrent conditions. 5 figures. E.G.S.

CLEANING COMPOSITIONS

MCCARTER, WILLIAM S. W. Adsorbent cleaning compositions and method of making same. Canadian patent 483,555. Filed May 6, 1946. Issued May 27, 1952. 4 claims. Assigned to Attapulgus Clay Company.

An adsorbent cleaning composition which is suitable for the removal of oil, grease, and water from wooden or concrete floors, linoleum, paper, and fabrics is a treated mixture of paper pulp, sawdust, or wood flour, and fuller's earth. This is the same as U. S. patent 2,480,753; *cf.* B.I.P.C. 20: 139. E.G.S.

COOKING PROCESS

FISHER, JOHN H., and MEAD, BRUCE R. Pulping lignocellulose with sodium aluminate. U. S. patent 2,601,110. Filed June 14, 1945. Issued June 17, 1952. 2 claims. Assigned to The Ontario Paper Company Limited. [Cl. 92-9]

In the preparation of pulp from fibrous lignocellulosic materials (e.g., sprucewood chips), the material is digested under autogenous pressure in an aqueous solution containing 2-15% of sodium aluminate as the active pulping agent at 185-200°C. for 2.5-3 hours. This is related to Canadian patent 444,664; *cf.* B.I.P.C. 18: 208. E.G.S.

DISPENSING CONTAINERS

GUYER, REYNOLDS. Tissue dispensing carton. U. S. patent 2,598,050. Filed June 10, 1948. Issued May 27, 1952. 2 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-17]

A dispensing carton for disposable tissues, napkins, and the like incorporates a pair of overlapping tongues which are designed to interlock when pressed inwardly so as to provide a triangular support for the remaining tissues in the carton. 5 figures. E.G.S.

EXPLOSIVES

GIRDLER, ROBERT M., and JOHNSON, NORMAN G. Dynamites containing shredded newspaper. Canadian patent 483,204. Filed April 2, 1943. Issued May 13, 1952. 2 claims. Assigned to E. I. du Pont de Nemours and Company.

A dynamite composition contains nitroglycerin as the principal liquid ingredient, an oxidant (e.g., sodium nitrate), and 5-20% by weight of a combustible, fibrous, absorbent material (e.g., shredded newspaper stock) for the liquid ingredients. E.G.S.

FOLDING BOXES

CASKEY, CECIL. Paper box. U. S. patent 2,597,289. Filed July 26, 1948. Issued May 20, 1952. 4 claims. [Cl. 229-32]

The blank of a folding box for candy and the like includes a small tab which lies adjacent to each corner of the finished box and is adapted to bridge across the gap between V-section flanges at each corner of the box. 6 figures. E.G.S.

GOTTESMAN, HERMAN. Inner lined folding carton. U. S. patent 2,599,708. Filed Nov. 14, 1949. Issued June 10, 1952. 2 claims. Assigned to The Permaline Company. [Cl. 229-14]

A cardboard carton for cough lozenges, candy, and the like incorporates an inner liner which is bonded to the inside of the box by small, closely spaced points of attachment (i.e., by "pin-point" lamination), as distinguished from ordinary surface attachment effected by strip, spot, and block methods of adhesion. Thus the liner is left free to pull clear of the carton wall in any direction in which strain is applied (e.g., during infolding of the box) without favoring lines of severance in any particular direction. 6 figures. E.G.S.

MYERS, HAROLD L. Container having slide-operated fold-back cover. U. S. patent 2,597,810. Filed Nov. 8, 1947. Issued May 20, 1952. 4 claims. [Cl. 229-19]

The upper portion of a slide-type cardboard box can be automatically adjusted to a display position in which the contents are rendered accessible for removal. 7 figures. E.G.S.

SCHMIRLER, LEONA W. Carton for holding eggs. U. S. patent 2,594,504. Filed July 22, 1949. Issued April 29, 1952. 2 claims. [Cl. 229-28]

The cover of an egg carton is lined with an adhesive strip for holding the eggs against accidental displacement or rolling when the cover is open. 13 figures. E.G.S.

TAYLOR, GERALD A. Box with locking handle. U. S. patent 2,598,945. Filed July 27, 1949. Issued June 3, 1952. 3 claims. Assigned to Cohoes Envelope Company, Inc. [Cl. 229-54; changed to 229-45]

A paperboard suit box embodies a paperboard, twisted-paper, or rope handle which has end portions extending through the top wall of the box and attached at their end portions to the top wall in such a manner that closure flaps can be inserted between the handle and the top wall when the handle is in a released and depressed condition. 6 figures. E.G.S.

WEISS, ARTHUR J. Folding carton. U. S. patent 2,598,627. Filed Oct. 11, 1949. Issued May 27, 1952. 2 claims. Assigned to Robert Gair Company, Inc. [Cl. 229-22]

A preglued folding carton which is erected in the form of a triangular prism is provided with a cellophane-covered display opening. 4 figures. E.G.S.

INSULATION AND INSULATING MATERIALS

GILMAN, LAWRENCE M. Apparatus for forming enclosed blanket insulation strips. U. S. patent 2,599,625. Filed April 1, 1948. Issued June 10, 1952. 1 claim. [Cl. 154-27]

In the formation of enclosed blanket insulation strips a wide, elongated batt or loose, fluffy sheet of insulating material is successively compacted, severed into several elongated strips, each of which is covered on both sides with paper webs; the two pieces of web are secured together along the side margins of the strips; and the strips are severed into units of any desired length and coiled into rolls for convenient handling and packaging. 4 figures. E.G.S.

LEATHERBOARD AND ARTIFICIAL LEATHER

WILSON, LUCIUS H., LANDES, CHESTER G., and MAXWELL, CHARLES S. Resin-impregnated leather board. U. S. patent 2,601,671. Filed Oct. 23, 1946. Issued June 24, 1952. 2 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

The essential feature of a process for the manufacture of resin-impregnated leatherboard is the flocculation of an aqueous dispersion of a water-insoluble organic impregnating agent (e.g., cationic melamine-formaldehyde resin) in an aqueous suspension of leather fibers. 2 claims. E.G.S.

MACHINERY—BINS

HURTER, ALFRED T. Storage bin with pressure-relieving baffles. U. S. patent 2,598,388. Filed April 16, 1948. Issued May 27, 1952. 2 claims. Assigned to Stadler, Hurter & Company. [Cl. 222-459]

This corresponds to Canadian patent 480,929; *cf.* B.I.P.C. 22: 541. 2 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

BARDET, GÉRARD. Machine for the manufacture and delivery of parallelopipedal paperboard boxes. U. S. patent 2,600,954. Filed June 30, 1949. Issued June 17, 1952. 5 claims. [Cl. 93-44.1]

A turret-type boxmaking machine is adapted to accept either precut, slitted box blanks stacked in a magazine, or a paperboard web which is stamped out on the machine by a mechanism operating in conjunction with the unit. 12 figures. E.G.S.

COLLINS, HOWARD A., and RUTH, HOWARD M. Tampon applicator grip forming apparatus. U. S. patent 2,600,971. Filed July 1, 1948. Issued June 17, 1952. 5 claims. Assigned to International Cellucotton Products Company. [Cl. 164-90]

An automatic, high-speed machine is designed to form finger-gripping areas on the outer surface of tampon applicator tubes. Sharp-pointed nodes or spurs are produced on the end two inches of each tube. 14 figures. E.G.S.

CONTI, JOHN D. Carton-sealing and handling machine. U. S. patent 2,597,922. Filed Feb. 18, 1949. Issued May 27, 1952. 8 claims. Assigned to American Viscose Corporation. [Cl. 216-9; changed to 216-20]

A package-sealing and -handling machine includes means for centering a carton with the line of juncture of its top flaps in alignment with a dispenser for a sealing strip or tape. A mechanism is also provided for tilting the sealed carton into an upended position in readiness for transfer to the next operation. 8 figures. E.G.S.

GAMBLE, HEDWIG. Machine for inserting filter plugs in cigarette tubes. U. S. patent 2,597,720. Filed July 27, 1950. Issued May 20, 1952. 4 claims. [Cl. 93-1]

A machine for making filter-tip cigarettes comprises a paper-tube maker, a filter-wad maker, means for inserting the wads into the ends of the paper tubes, and means for conveying the paper tubes with inserted wads to a tobacco-filling device which is adapted to insert tobacco into the tubes. 29 figures. E.G.S.

KINDSETH, HAROLD V. Bag supporting means for bag closing and sealing machines. U. S. patent 2,599,393. Filed Dec. 1, 1950. Issued June 3, 1952. 11 claims. Assigned to Bemis Bro. Bag Co. [Cl. 53-57]

Means are provided for receiving and holding paper bags filled to a predetermined level and for maintaining the bags in correct relationship to a bag-closing and -sealing mechanism. The bag-holding compartment is readily adjustable to accommodate bags of various sizes. 9 figures. E.G.S.

LEVKOFF, DAVID. Machine for setting-up box blanks. U. S. patent 2,598,569. Filed Feb. 7, 1948. Issued May 27, 1952. 5 claims. [Cl. 93-53]

A machine which is adapted for the setting up of folding boxes incorporates pneumatic means (i.e., suction cups) for transferring the box blanks from a hopper to the folding mechanism. 34 figures. E.G.S.

LIEBL, ALBERT W. Conveyer mechanism for folding carton blanks. U. S. patent 2,598,809. Filed Sept. 4, 1948. Issued June 3, 1952. 15 claims. Assigned to Container Corporation of America. [Cl. 93-49]

A carton-folding machine incorporates a series of chain-mounted lugs and folding fingers for forming and setting up paperboard boxes from blanks. 7 figures. E.G.S.

MERRY, RICHARD C. Method and apparatus for assembling partitions for packing cells. Canadian patent 483,526. Filed Nov. 8, 1948. Issued May 27, 1952. 44 claims.

A partition-assembling machine consists of at least one partition-feeding unit and one cross partition-feeding unit, in which the units are synchronized with respect to each other; the cross-partition unit embodies the necessary adjustable synchronizing mechanism. 22 figures. E.G.S.

PALMER, CHARLES E. Box forming machine. U. S. patent 2,599,008. Filed Nov. 8, 1949. Issued June 3, 1952. 22 claims. Assigned to Package Machinery Company. [Cl. 93-51.1]

A boxmaking machine is adapted for folding prescored or creased blanks into box form and adhesively securing the box in its setup condition. The machine is adapted for setting up boxes with single-ply side walls and boxes with two-ply side and/or end walls. 45 figures. E.G.S.

ROSE, ALFRED G., and PAGE, JAMES. Carton opening machine. U. S. patent 2,598,071. Filed Feb. 25, 1947. Issued May 27, 1952. 5 claims. Assigned to Rose Brothers (Gainsborough) Limited. [Cl. 93-53]

A high-speed carton-feeding apparatus includes a number of transfer blades which are spaced apart at equal intervals around a closed path, means for translating the blades together unidirectionally around the path to bring each blade in turn to a separating station, means operable in timed sequence with the translation of the blades for moving each blade in turn in an endwise direction to insert it between the front and rear portions of the leading carton, and means operable at a subsequent station for withdrawing the inserted blade from engagement with the carton. 7 figures. E.G.S.

SCHMIED, JOSEPH M. Carton closing and flap tucking machine. U. S. patent 2,598,135. Filed Nov. 26, 1949. Issued May 27, 1952. 6 claims. Assigned to Package Machinery Company. [Cl. 53-147]

A carton-closing device includes means for positioning a tuck-in closure flap within a carton without interrupting the movement of the carton through the machine. 7 figures. E.G.S.

WETHE, HARRY K., and DUNCANSON, ROBERT H. Container blank delivery mechanism. U. S. patent 2,598,150. Filed Aug. 17, 1949. Issued May 27, 1952. 5 claims. Assigned to Package Machinery Company. [Cl. 271-10; changed to 271-14]

A device is designed to remove warped or bent sheets from a stack of container blanks one at a time, flatten the blanks, and deliver them accurately positioned on a delivery table of a box-forming machine. 12 figures. E.G.S.

WIXON, PAUL E., and CHAPMAN, CLARENCE E. Bottom expander. U. S. patent 2,600,355. Filed May 23, 1949. Issued June 10, 1952. 3 claims. Assigned to Joseph Shapiro. [Cl. 93-36.5]

A machine for making paper cups is provided with means for expanding the flange of a cup-shaped end-closure member against the side wall of the cup body. 12 figures. E.G.S.

MACHINERY—CORRUGATING MACHINE

MUMMA, ELMER L. Single facer drive. U. S. patent 2,600,907. Filed Oct. 4, 1947. Issued June 17, 1952. 8 claims. Assigned to F. X. Hooper Company, Inc. [Cl. 154-31]

A single-facer corrugating machine incorporates means for changing the speed of the presser-roll driving motor independently of the motor driving the corrugating roll. 6 figures. E.G.S.

MACHINERY—CURLATOR

COGHILL, JAMES T., and HILL, HAROLD S. Gyratory processing apparatus. U. S. patent 2,599,543. Filed June 6, 1946. Issued June 10, 1952. 6 claims. Assigned to Curlator Corporation. [Cl. 92-26]

A gyratory refiner for paper pulp comprises two opposed coacting elements with tractive working surfaces which are designed to engage a relatively thin layer of pulp; means for maintaining and controlling the clearance between the working surfaces; and means for imparting a gyratory, relatively tangential motion to the surfaces. The untreated pulp is continuously fed between the surfaces at one edge zone, and the refined pulp is removed at another zone. 2 figures. E.G.S.

MACHINERY—CUTTERS

BEUERMAN, RALPH A. Register control system for web cutting mechanisms. U. S. patent 2,599,430. Filed March 29, 1950. Issued June 3, 1952. 1 claim. Assigned to E. I. du Pont de Nemours and Company. [Cl. 164-68]

A device for continuously cutting printed bands from a paper web imprinted with unit designs is equipped with cutoff register control means which are designed to maintain the cutter knife in synchronization with the design printed on the web. 4 figures. E.G.S.

NEESE, ALONZO A. Synchronous drive. U. S. patent 2,598,820. Filed Nov. 29, 1949. Issued June 3, 1952. 1 claim. Assigned to Beloit Iron Works. [Cl. 164-61]

A sheet cutter is provided with a synchronous drive which is capable of delivering power through repeated accelerating and decelerating cycles without creating a backlash in the driving connections, so that a nonslipping-type speed changer can be coupled directly to the drive assembly. 8 figures. E.G.S.

MACHINERY—DOCTORS

WARNER, EDGAR. Wiping blade for coating devices. U. S. patent 2,598,733. Filed March 16, 1949. Issued June 3, 1952. 6 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 118-118]

A wiping blade for a coating machine comprises a rotating rod and a bearing which is continuous throughout the length of the rod. The bearing is formed of two metal strips which are in contact with each other throughout a substantial part of their width, but are spaced apart near one edge and shaped to hold the rod between them. 3 figures. E.G.S.

MACHINERY—FILTERS

BAUER, JORDAN V., and CURTIS, RUSSELL H. Filter element. U. S. patent 2,599,604. Filed July 13, 1949. Issued June 10, 1952. 6 claims. [Cl. 210-169]

An oil-filter element which is designed for use in internal combustion engines comprises a convolutely wound roll of single-faced corrugated strip in which alternate corrugations are sealed at opposite ends of the corrugations. 8 figures. E.G.S.

ERICSON, GEORGE R. Filter. U. S. patent 2,597,235. Filed June 16, 1947. Issued May 20, 1952. 1 claim. Assigned to Carter Carburetor Corporation. [Cl. 210-181]

Each filter-leaf element of an automotive lubricating oil filter comprises a pair of sheets of filter paper which are separated by a thin-gage, sheet-metal, platelike spacer member. 6 figures. E.G.S.

GUNN, EARL G. Filter element. Canadian patent 483,210. Filed Sept. 23, 1948. Issued May 13, 1952. 2 claims. Assigned to Fram Corporation.

A cross-flow paper filter for lubricating or fuel oil is designed for a relatively high flow rate and for the removal of small particles. This is the same as U. S. patent 2,553,820; *cf.* B.I.P.C. 21: 820. 8 figures. E.G.S.

MACHINERY—GRINDERS

TIDMARSH, WILLIAM R. Apparatus for grinding wood. Canadian patent 483,539. Filed Jan. 23, 1947. Issued May 27, 1952. 16 claims.

A grinder includes a rotary drum which is mounted on a suitable base; a rotating stone is located eccentrically within the drum and is arranged relative to the inner surface of the drum to form a wedge-shaped chamber into which the wood is fed to be ground between the co-operating surfaces of the stone and drum. 8 figures. E.G.S.

MACHINERY—HEAD BOX

STAEGE, STEPHEN A. Feed regulator for paper machinery. U. S. patent 2,598,852. Filed July 24, 1946. Issued June 3, 1952. 3 claims. Assigned to The Black-Clawson Company. [Cl. 92-46]

A stock-supply control system for a paper machine includes a pump which is positioned to supply stock from the screen to the wire and whose output

is regulated by controls responsive to changes in the supply of stock from the screen to maintain uniform pressure on the stock at its point of delivery to the wire. 2 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

BEUTEL, ROBERT J. Wrapping machine for articles of varying sizes. U. S. patent 2,600,833. Filed May 28, 1946. Issued June 17, 1952. 59 claims. Assigned to American Machine and Foundry Company. [Cl. 53-15]

A bread-wrapping machine incorporates a mechanism which supports and holds a portion of a wrapper draped in the path of travel of a loaf of bread onto an article-lifter table. 13 figures. E.G.S.

HOAG, RODERICK W. Machine for making fluted containers. U. S. patent 2,597,994. Filed June 24, 1948. Issued May 27, 1952. 2 claims. [Cl. 53-89; changed to 53-61]

A machine is provided for converting a corrugated paper web into a succession of pockets made from the flutes of the corrugations, filling the pockets with a granular or powdered material, and sealing the material within the pockets to produce filled, individual shaker packages. 11 figures. E.G.S.

MACHINERY—PASTING MACHINE

DAVIS, WILLIAM L. Liquid adhesive applicator and control apparatus therefor. U. S. patent 2,599,374. Filed July 10, 1948. Issued June 3, 1952. 3 claims. Assigned to Union Bag & Paper Corporation. [Cl. 118-7]

An adhesive control apparatus which is designed for regulating the level in paste pots on paper bag-making machines has a beam pivotally mounted on a support; an adhesive receptacle carried by one end of the beam, which permits the opposite end of the beam to swing in an arc as the adhesive level in the receptacle changes; a control device actuated by the movement of the beam; and a feed line for supplying adhesive to the receptacle. 2 figures. E.G.S.

RANEY, EDWIN A. Apparatus for affixing conducting tap straps to paper mounting strips. U. S. patent 2,600,322. Filed July 31, 1948. Issued June 10, 1952. 1 claim. Assigned to General Electric Company. [Cl. 154-1.6]

This is an apparatus which is adapted for carrying out the method of U. S. patent 2,601,005; see abstract below. 1 figure. E.G.S.

RANEY, EDWIN A. Method of affixing conducting tap straps to a paper mounting strip. U. S. patent 2,601,005. Filed Sept. 17, 1949. Issued June 17, 1952. 1 claim. Assigned to General Electric Company. [Cl. 154-80]

A process is described for transversely affixing a number of conducting tap straps, employed as terminals in electrical condensers, at spaced, equal intervals to a strip of mounting material (e.g., a longitudinal strip of insulating paper). 1 figure. E.G.S.

MACHINERY—ROLL STANDS

PREVOST, BRUNO E. Back stand for rolls of paper. U. S. patent 2,599,720. Filed April 5, 1948. Issued June 10, 1952. 11 claims. Assigned to John W. Bolton & Sons, Inc. [Cl. 242-58]

A backstand incorporates several pairs of short core shafts, each with a journal or pivot member and all of the same diameter, so that all the bearings in the stand can be of the same diameter; tapered thimbles are fixed to the short core shafts. 11 figures. E.G.S.

MACHINERY—SHEET STACKERS

ESSEX, ALOIS, GARRETT, ELMER E., and KALLENBERG, JOHN. Apparatus for stacking carton blanks. U. S. patent 2,599,442. Filed March 4, 1950. Issued June 3, 1952. 6 claims. Assigned to The Sperry Corporation. [Cl. 271-71]

In the stacking of small carton blanks as they come from the forming stage, a traveling cardboard web is weakened at regularly spaced intervals along its length; two opposed lateral notches are formed between the weakened or tearing lines; the end section is suddenly accelerated in advance of the foremost transverse tearing slit, and thus the advanced section is torn off; and successive separated blank sections are gripped and moved to a position where they are stacked with their notches upon a pair of rods. 20 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

ROEN, GUNNAR. Paper winding machine. U. S. patent 2,599,942. Filed March 17, 1947. Issued June 10, 1952. 12 claims. [Cl. 242-56]

An automatic rewinder for small rolls of paper (e.g., counter rolls, toilet paper, cash-register strips, etc.) incorporates a smooth-action rewinding spindle. 5 figures. E.G.S.

MACHINERY—SUCTION BOXES

EVANS, JAMES W. W. Apparatus for extracting water from webs of pulp or paper. U. S. patent 2,601,378. Filed Jan. 31, 1947. Issued June 24, 1952. 5 claims. [Cl. 92-52]

A paper machine incorporates a traveling, grooved, perforated, continuous rubber belt which supports the wire in the region of an open-top stationary suction box; a deckle is located in at least one end of the box and is designed to control the suction applied to the adjacent edge of the belt. This corresponds to Canadian patent 465,063; *cf.* B.I.P.C. 20: 762. 10 figures. E.G.S.

MACHINERY—TUBE MAKING MACHINE

VON LIEDTKE, RUDOLPH H. Tube and method of making the same. U. S. patent 2,599,878. Filed Sept. 4, 1945. Issued June 10, 1952. 1 claim. Assigned to McGraw Electric Company. [Cl. 92-66]

In the manufacture of wound paper tubes from pulp, a stitching roller which is provided with a number of prongs around its periphery is used to depress portions of successive pulp layers and to force those portions into

the preceding layers, thus creating the effect of stitching the layers together. 14 figures. E.G.S.

MOLDED PULP ARTICLES

RANDALL, WALTER H. Pulp molding die. U. S. patent 2,600,265. Filed March 27, 1947. Issued June 10, 1952. 1 claim. Assigned to The Canal National Bank of Portland and William B. Nulty. [Cl. 92-54]

An open-face, sectional, wire-covered pulp-molding die is described in which the individual wire-mesh screen coverings for the die sections may be readily conformed, without substantial distortion, to the sectional molding surface of the die. 3 figures. E.G.S.

SCHILLING, RUTH M. Egg carton. U. S. patent 2,600,130. Filed Dec. 3, 1945. Issued June 10, 1952. 8 claims. Assigned to Shellmar Products Corporation. [Cl. 229-2.5]

This corresponds to Canadian patent 475,544; *cf.* B.I.P.C. *22*: 76. E.G.S.

PACKAGING

HARRY, GEORGE H. Commodity package. U. S. patent 2,598,373. Filed Feb. 9, 1950. Issued May 27, 1952. 1 claim. [Cl. 99-174]

A package for thin slices or patties of meat consists of a waxed-paper inner wrapper, a flat stiffening member, and a transparent outer wrapper. 5 figures. E.G.S.

OVERLAND, LEO D., and LEVINE, JACK W. Ice cream sandwich method and article. Canadian patent 483,670. Filed March 27, 1950. Issued June 3, 1952. 5 claims.

A carton for an individual ice-cream sandwich embodies inner flanges and end flaps for holding two wafers in place while the space between them is filled with fluid ice-cream mix. 8 figures. E.G.S.

POOLE, WILLIAM J. Frozen food carton with plastic lid. Canadian patent 483,573. Filed Sept. 21, 1949. Issued May 27, 1952. 5 claims. Assigned to Container Corporation of America.

A re-usable waxed-paperboard frozen food container is provided with a transparent plastic lid which forms a wedgelike, liquidtight seal with the upper edge of the carton. 5 figures. E.G.S.

SCOVILLE, DAVID M. Paper package. U. S. patent 2,600,927. Filed Feb. 15, 1949. Issued June 17, 1952. 8 claims. [Cl. 206-57]

A package of paper comprises a stack of separate, interleaved carbon and second sheets, in which the carbon sheets are longer than the second sheets and are formed with a notch to receive a guide for maintaining the alignment of the second sheets. The stack is packaged in a cardboard box. 4 figures. E.G.S.

WESLEY, ROBERT O. Packaging means for toy pistols. U. S. patent 2,601,192. Filed Dec. 24, 1947. Issued June 17, 1952. 3 claims. Assigned to Daisy Manufacturing Company. [Cl. 206-65]

A cardboard carton which is designed for the packaging of toy pistols is constructed without fillers or spacers which are usually employed to prevent the displacement of the gun within the carton. The width of the carton approximates the width of the pistol structure ahead of the grip, and the rear end is open to permit the pistol to be slipped into the carton. 4 figures. E.G.S.

PAPER—COATED

COOK, JAMES G., and WATTS, JOHN T. Compositions useful for coating, impregnating, adhesive or like purposes. Canadian patent 483,225. Filed Dec. 20, 1944. Issued May 13, 1952. 12 claims. Assigned to Imperial Chemical Industries Limited.

A composition comprising a polyester amide and an organic diisocyanate (e.g., hexamethylene diisocyanate) dissolved in an organic solvent is utilized for the coating and impregnation of paper, leather, and the like. E.G.S.

COWGILL, WILLIAM W. Synthetic resin coated paper. U. S. patent 2,597,087. Filed April 9, 1951. Issued May 20, 1952. 4 claims. Assigned to United States Rubber Company. [Cl. 117-155]

A glossed paper product is produced by coating one or both surfaces of a paper web with a thin, continuous, flexible, transparent film of polymeric material selected from the group consisting of resinous copolymers of styrene (65-80%) and acrylonitrile (20-35%) and mixtures consisting of 50-95% of the above copolymer and 5-50% of a rubbery copolymer of 1,3-butadiene and acrylonitrile. The coating is manifested as a highly glossed film which is tenaciously adherent to the surface of the paper. The amount of coating applied ranges from 0.1 to 3.0 pounds per 1000 sq. ft. of coated surface. E.G.S.

GRIMSON, SAMUEL B. Coating head. U. S. patent 2,598,908. Filed Feb. 24, 1950. Issued June 3, 1952. 5 claims. Assigned to Color Research Corporation. [Cl. 118-401]

A coating head incorporates a narrow, slotlike orifice on which a meniscus is formed and which is located in the wall of the coating-supply reservoir; the orifice is fed directly from the reservoir uniformly throughout its length, with practically no possibility of the orifice becoming clogged or of the liquid flow being impeded. 4 figures. E.G.S.

PAPER—COATED (WRINKLE COATING)

WALDIE, WILLIAM A. Air-drying wrinkle finish and method of making. U. S. patent 2,600,818. Filed Sept. 18, 1947. Issued June 17, 1952. 11 claims. Assigned to New Wrinkle, Inc. [Cl. 260-18; changed to 260-19]

An air-drying wrinkle-coating composition consists of 2.25 gal. of varnish, 0.5 gal. of raw tung oil, 0.75 gal. of xylol, 0.25 gal. of butanol, and 0.06 gal. of a 6% solution of manganese naphthenate. The varnish comprises 100 lb. of phenylphenol-formaldehyde resin, 10 gal. of oiticica oil, 2 lb. of red lead, 5 gal. of xylol, and 10 gal. of toluene. E.G.S.

PAPER SPECIALTIES

BOERSMA, BARNEY, and PARCELS, A. ARNOLD. Method of mak-

ing tacking strip. U. S. patent 2,597,918. Filed March 6, 1947. Issued May 27, 1952. 4 claims. Assigned to Sackner Products, Inc. [Cl. 57-165]

A tacking strip for upholstery is formed of strips of twisted, compressed paper which is impregnated with a microcrystalline or other moisture-excluding wax which also serves as an adhesive for the impregnated portions of the strip. 4 figures. E.G.S.

BOHRER, GEORGE J. Wax-resin compositions. Canadian patent 483,726. Filed June 18, 1946. Issued June 3, 1952. 13 claims. Assigned to Canadian General Electric Company, Limited.

A dielectric composition which is suitable for the impregnation of or combination with paper, cellophane, cellulose esters, and the like consists of 10-90% of a synthetic wax (e.g., an *N*-substituted chlorophthalimide) and 10-90% of a compatible resinous composition (e.g., the reaction product of a glycol, tetrachlorophthalic anhydride, and stearic acid). The material is also adapted for the flameproofing of textile fabrics. 2 figures. E.G.S.

BONGIOVANNI, ANTONIO. Individual neck duster. U. S. patent 2,597,772. Filed June 2, 1949. Issued May 20, 1952. 2 claims. Assigned 15.5% to Antonio Stango, 15.5% to Antonio Oteri, 10% to Alfred Stango, 11.5% to John W. Kephart, Jr., and 11.5% to A. Evans Kephart. [Cl. 15-226]

A disposable, individual neck duster which is adapted for use in barber shops is formed from a single paper blank which is so fashioned that a handle and tuft are produced by winding the blank into a more or less tight roll. 10 figures. E.G.S.

BONINI, JOHN H. Laminated sheet material for packaging moisture-containing foods. Canadian patent 483,610. Filed May 18, 1951. Issued May 27, 1952. 5 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,559,109; *cf.* B.I.P.C. 22:78. E.G.S.

BUTLER, JOHN M. Wax compositions. U. S. patent 2,580,996. Filed July 16, 1948. Issued Jan. 1, 1952. 8 claims. Assigned to Monsanto Chemical Company. [Cl. 260-28.5]

A paper-coating composition consists of 60-99.98% of a paraffin wax and the balance of an alkylated polystyrene obtained by the reaction of polystyrene with a propylene polymer. The composition is particularly adapted for the impregnation of paper which is to be used for wrapping where some degree of adhesiveness is desired. E.G.S.

CRAIG, MERLE E. Siftproof bag bottom. U. S. patent 2,600,487. Filed July 6, 1948. Issued June 17, 1952. 1 claim. Assigned to Crown Zellerbach Corporation. [Cl. 229-59]

A siftproof, multi-ply paper bag for the shipment of carbon black or similar powdery material embodies a pasted bottom structure. 5 figures. E.G.S.

DANIEL, AL F., and PATTERSON, THOMAS A. Shoe polisher. U. S.

patent 2,599,095. Filed May 1, 1950. Issued June 3, 1952. 5 claims. [Cl. 15-209]

A shoe polisher comprises a tough, elongated, flexible paper backing strip which has a roughened rear surface to serve as a preliminary cleaner for shoes, and alternate layers of soft, flexible, absorbent paper or tissue, in the form of applicator strips and buffer strips, which are stapled to the backing strip. 3 figures. E.G.S.

DOYLE, JAMES F. Bag. U. S. patent 2,597,305. Filed Nov. 20, 1946. Issued May 20, 1952. 4 claims. Assigned to Arkell Safety Bag Company. [Cl. 229-53]

A bag which is adapted for use in the packaging of dehydrated food and blood plasma is formed of two plies of crinkled paper laminated together with an asphaltic adhesive. 14 figures. E.G.S.

FRANZEN, GILBERT E. Spoon cover. U. S. patent 2,598,987. Filed March 15, 1949. Issued June 3, 1952. 3 claims. [Cl. 229-43]

A paper cup for the individual packaging of ice cream embodies a combination cover and scoop-shaped spoon which is designed to resist bending stresses. 7 figures. E.G.S.

HAIR, EMMA. Disposable feeding bottle for babies. U. S. patent 2,599,630. Filed Aug. 29, 1949. Issued June 10, 1952. 1 claim. [Cl. 215-11]

A nursing bottle embodies a disposable, frustoconical, waterproof paper or cardboard container which is secured to a nipple by a plastic screw-flange arrangement. 1 figure. E.G.S.

HUMPHNER, FERDINAND W. Calendered crinkled paper and process of manufacture. U. S. patent 2,598,173. Filed June 28, 1947. Issued May 27, 1952. 10 claims. [Cl. 154-33.05]

A web of crinkled or creped paper is calendered without the removal of the folds by the direction of the paper into or between two calender rolls placed at such an angle (e.g., 45°) that the transverse folds of the paper approach the squeeze rolls with the points of the crinkling entering sideways. 5 figures. E.G.S.

JAHODA, EDWARD. Method of making photographic paper. U. S. reissue patent 23,510. Filed Aug. 10, 1950. Issued June 10, 1952. 3 claims. Assigned to H. P. Andrews Paper Company. [Cl. 117-34] *cf.* B.I.P.C. 21: 795.

A precoating composition of silica sol is intended for application to photosensitive paper, such as blueprint, Vandyke print, diazotype print, and photographic paper to which size has been previously applied. This is a reissue of U. S. patent 2,433,515 (*cf.* B.I.P.C. 18: 416), which was the same as Canadian patent 448,981 (*cf.* B.I.P.C. 18: 808). 1 figure. E.G.S.

JOHNSON, ARTHUR, and MILLATT, EDWIN G. Forming paper from modified calcium alginate fibers. U. S. patent 2,600,504. Filed June 4, 1948. Issued June 17, 1952. 6 claims. Assigned to Alginate Industries Limited. [Cl. 92-21]

A papermaking process consists in reducing calcium alginate fibers to the form of a short-fiber aqueous pulp; introducing sufficient sodium carbonate to combine with 15-55% of the calcium in the alginate, thus causing the alginic fibers to swell; and felting the swollen fibers into a paper sheet. E.G.S.

KELLETT, WILLIAM R., and VELER, LOUIS G. Catamenial bandage and absorption control element therefor. U. S. patent 2,600,882. Filed April 4, 1946. Issued June 17, 1952. 3 claims. Assigned to International Cellucotton Products Company. [Cl. 128-290]

A method and apparatus are adapted for the formation of an absorption-control element for sanitary napkins. The element comprises top and bottom crepe tissue paper members and an intervening layer of wax-sized fluff. 12 figures. E.G.S.

KERR, JAMES G. Dual-purpose envelope. U. S. patent 2,600,114. Filed June 5, 1945. Issued June 10, 1952. 12 claims. [Cl. 229-73]

A dual-purpose mailing and return envelope is constructed in such a manner that the name and address of the addressor is covered while the envelope is being forwarded to the addressee and is uncovered by the act of resealing for return to the addressor. 46 figures. E.G.S.

MCCRERY, HAROLD E., and JESSER, ALBERT E. Bag bottom structure. U. S. patent 2,599,567. Filed Dec. 28, 1944. Issued June 10, 1952. 10 claims. Assigned to Plyfiber Container Company. [Cl. 229-57]

A paper bag which is adapted for the packaging of solidified, initially fluid or plastic materials (e.g., tar, wax, rosin, heavy grease, and the like) is provided with a reinforced folded bottom structure, in which the joints of superimposed folds are relatively offset and sealed. 9 figures. E.G.S.

MELLEN, GLENN L., and HALL, VINCENT C., JR., Selectively demetalizing condenser paper. U. S. patent 2,597,511. Filed Oct. 1, 1949. Issued May 20, 1952. 7 claims. Assigned to National Research Corporation. [Cl. 219-19]

In the manufacture of electrical condensers from strips of zinc-coated paper, an apparatus is equipped with electrodes which move into and out of engagement with the coated web, and means are provided for maintaining a sufficient potential difference between one of the electrodes in contact with the web and the metal face of the web to create an arc between the coating and the electrode. The arc serves to vaporize the metallic coating in the area to be striped. 2 figures. E.G.S.

O'GRADY, AUSTIN P. J. Inhalant preparation. U. S. patent 2,598,823. Filed Nov. 29, 1948. Issued June 3, 1952. 1 claim. [Cl. 21-117]

An inhalant sachet comprises a flattened tube of porous paper; an exothermic reaction mixture (e.g., aluminum filings, copper sulfate, potassium chlorate, iron filings, and fuller's earth) adapted to generate heat and steam upon the addition of water; an inhalant (e.g., menthol, oil of eucalyptus, and tincture of benzoin) in admixture with the exothermic reaction mixture; a wrapping for the flattened tube made of material which is substantially

impervious to water and steam; and a disposable waterproof covering (e.g., a transparent rubber film) for the sachet. 4 figures. E.G.S.

RICKARD, CHARLOTTE I., and HARWOOD, KENNETH J. Sanitary napkin. U. S. patent 2,600,576. Filed Aug. 4, 1950. Issued June 17, 1952. 10 claims. Assigned to International Cellucotton Products Company. [Cl. 128-290]

The absorbent pad of a sanitary napkin comprises outer layers of creped tissue paper and intermediate layers of fluff on tissue paper backing, as well as inner equalizer and baffle layers. 11 figures. E.G.S.

RULE, JOSEPH M. Process of making stable silica sols and resulting composition. U. S. patent 2,577,485. Filed Sept. 8, 1950. Issued Dec. 4, 1951. 22 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 252-313]

A stable silica sol which is recommended for use in stiffening or increasing the contrast of photocopying papers is prepared by subjecting a silica sol containing amorphous silica particles (average diameter 10-130 mμ) to successive cation- and anion-exchange treatments, and adding an alkali metal hydroxide (e.g., lithium or sodium hydroxide) to the sol. E.G.S.

WALTON, GEORGE. Cold process transfer coating compositions. U. S. patent 2,598,332. Filed Nov. 29, 1948. Issued May 27, 1952. 4 claims. [Cl. 106-31; changed to 106-8]

A cold-process transfer-coating composition for paper or similar base material comprises 7-25% of a solid wax, 50-70% of a nondrying oil with an S.A.E. viscosity of not over 250, and a coloring agent. E.G.S.

WATSON, WILLIAM R., JR., and SWISS, JACK. Flexible mica insulation. Canadian patent 483,300. Filed May 16, 1951. Issued May 13, 1952. 4 claims. Assigned to Westinghouse Electric Corporation.

A flexible mica insulation comprises a sheet backing material (e.g., kraft, rope, or asbestos paper), a layer of mica flakes applied to the backing, and 3-15% (based on the weight of mica flakes) of a flexible, tacky, stable binder (e.g., a mixture of liquid α-methylstyrene polymer and butadiene-styrene copolymer) for bonding the flakes to the backing sheet. 3 figures. E.G.S.

WHITMAN, HARLAN M. Envelope. U. S. patent 2,600,146. Filed Oct. 2, 1947. Issued June 10, 1952. 2 claims. Assigned to Curtis 1000, Incorporated. [Cl. 229-92.1]

A message which is written on the inner surface of a third-class mailing envelope can be inspected by postal authorities but is normally concealed by the folds of the envelope. 6 figures. E.G.S.

PAPER SPLICING

TOLLISON, PAUL L. Web roll accelerating apparatus. U. S. patent 2,601,071. Filed Jan. 21, 1949. Issued June 17, 1952. 11 claims. Assigned to Wood Newspaper Machinery Corporation. [Cl. 242-58]

An accelerating mechanism is provided with an axial drive for rapidly bringing a fresh paper roll up to splicing speed in an accurate, dependable manner, regardless of the size of the fresh roll and the speed of the running web. 10 figures. E.G.S.

PHYSICAL TESTING—PAPER

ROGERS, ROBERT W., and REBACK, SAMUEL. Test clamp for test specimen. U. S. patent 2,600,923. Filed June 18, 1947. Issued June 17, 1952. 3 claims. Assigned to Scott Testers, Inc. [Cl. 24-248]

A toggle clamp for gripping test specimens is provided with an adjustment which may be calibrated and marked so that the jaws of the clamp may be reset for different thicknesses or for different types of specimens. 6 figures. E.G.S.

PHYSICAL TESTING—PULP—SAMPLING

GREEN, CHARLES M. Sampling device. U. S. patent 2,598,535. Filed June 30, 1948. Issued May 27, 1952. 4 claims. Assigned to Mosinee Paper Mills Company. [Cl. 73-422]

A sampling device is adapted for the removal of pulp samples from a digester during the cook. The mechanism comprises an air cylinder in which a reciprocating piston is mounted; the movement of the piston is determined by the introduction of air under pressure from a suitable air source controlled by a solenoid-operated valve which, in turn, may be controlled by a timer to determine the size and frequency of the samples. The reciprocating piston is secured to a piston rod which is connected to a plunger movable in a cylindrical bore formed in a mounting block secured to the container in which the withdrawn sample is confined. The forward edge of the plunger is provided with a sharp cutting edge to shear off and eject knots and other solid materials which may be present in the pulp suspension and which would tend to jam the sampling device by wedging in ports in the mounting block. 3 figures. E.G.S.

PIGMENTS

CRAIG, WILLIAM L. Cellulosic fibrous calcium silicate pigment, a method of making it and a sheet of paper containing it. U. S. patent 2,599,094. Filed Dec. 10, 1949. Issued June 3, 1952. 15 claims. Assigned to R. T. Vanderbilt Company, Inc. [Cl. 92-3]

A highly pigmented paper pulp comprises the dried residue of swollen, hydrated, and gelatinized pulp fibers and an amount of finely divided pigment (e.g., precipitated, hydrated calcium silicate) in excess of the dry weight of the fibers. The highly pigmented material forms a pulplike mass upon the addition of water. The pulp is suitable for admixture with untreated stock in making the coating layer or liner of multi-ply paper or board. E.G.S.

CRAIG, WILLIAM L. Forming pigment in cellulose fiber and paper containing the pigmented fiber. U. S. patent 2,599,091. Filed April 23, 1946. Issued June 3, 1952. 15 claims. Assigned to R. T. Vanderbilt Company, Inc. [Cl. 92-3]

A method of producing a pigmented, gelatinized cellulosic stock which is particularly adapted for admixture with unpigmented stock in the manu-

facture of paper comprises the steps of gelatinizing, at ordinary temperatures, the fibers in an aqueous pulp suspension (e.g., groundwood or chemical pulp) with a concentrated calcium chloride solution, and precipitating calcium carbonate in and on the gelatinized fibers by the addition of a soluble compound (e.g., sodium carbonate) which reacts with calcium chloride. E.G.S.

CRAIG, WILLIAM L. Multiple layer paper containing pigmented pulp and method of making. U. S. patent 2,599,092. Filed April 30, 1946. Issued June 3, 1952. 10 claims. Assigned to R. T. Vanderbilt Company, Inc. [Cl. 92-3]

A method for the manufacture of multilayer paper and board comprises the steps of gelatinizing pulp fibers (e.g., groundwood or chemical pulp) in a concentrated calcium chloride solution, precipitating calcium carbonate in and on the gelatinized fibers by the addition of sodium carbonate, and using the resulting pigmented stock to form an outer layer or liner for a multilayer sheet. E.G.S.

CRAIG, WILLIAM L. Pigmented cellulose fiber. U. S. patent 2,599,093. Filed March 17, 1948. Issued June 3, 1952. 12 claims. Assigned to R. T. Vanderbilt Company, Inc. [Cl. 106-204]

A method is described for the preparation of dry fibrous pigments (e.g., from groundwood stock). This corresponds to Canadian patent 468,721; *cf.* B.I.P.C. 21: 217. E.G.S.

WEBER, IRA. Coating compositions. U. S. patent 2,600,593. Filed July 28, 1950. Issued June 17, 1952. 9 claims. Assigned to Interchemical Corporation. [Cl. 260-22; changed to 260-21]

A process of pigmentizing a coating composition includes the steps of dissolving 0.23 part of Rhodamine B base in 54 parts of a vehicle comprising a 50% solution of a 38% soybean oil-modified alkyd in an aromatic hydrocarbon mixture from petroleum (boiling range 160-184°C.); dispersing 30 parts of heat-treated urea-formaldehyde resin in the form of fine particles in the vehicle; and affixing the Rhodamine B base as a solid solution in the resin particles. E.G.S.

PURIFIED WOOD FIBER

MARTIN, MERVIN E., and SHERK, DANIEL L. Two-step digestion of wood with aliphatic acid. U. S. patent 2,601,408. Filed Aug. 29, 1947. Issued June 24, 1952. 5 claims. Assigned to Celanese Corporation of America. [Cl. 92-9]

A process for the preparation of purified wood cellulose comprises the steps of digesting wood (e.g., white birch chips) for 5-60 minutes at 150-160°C. with a 50-70% aqueous solution of acetic acid, containing 0.5-1.0% of phosphoric acid (based on the weight of the wood) and subjecting the digested material to at least one additional digestion for 5-60 minutes at 150-160° with a 30-40% aqueous solution of acetic acid which contains 0.5-1.0% of phosphoric acid (based on the wood). The product is suitable for conversion into cellulose derivatives of high clarity and freedom from color. E.G.S.

RESIN, SYNTHETIC

WALTON, RICHARD K. Alkali resistant alkylene polyamine modi-

fied phenol-formaldehyde resin. U. S. patent 2,585,196. Filed March 13, 1946. Issued Feb. 12, 1952. 22 claims. Assigned to Union Carbide and Carbon Corporation. [Cl. 260-33.2]

As an example, a resin solution which is adapted for the impregnation of paper, textile, and asbestos sheets in the manufacture of laminated panels is prepared by the reaction under reflux conditions of 188 grams of phenol with 162 grams of 37% aqueous formaldehyde in the presence of 8 grams of aqueous ammonium hydroxide as a catalyst until the condensate has a refractive index of 1.545. The resultant substance is dehydrated by heating to 70°C. *in vacuo* (three inches of mercury); 50 grams of ethanol and 68 grams of diethylenetriamine are added to the dehydrated resin, and the mixture is heated to 92° under reflux for 15 minutes. The reaction mixture is cooled to 50°, and 150 grams of additional ethanol and 40 grams of paraformaldehyde are added to and allowed to react with the mixture while heated under reflux at 85° until the resin has a gel time of 35 seconds at 160°. The resin solution has good impregnating properties, and after its impregnation in paper, can be dried at elevated temperatures without unduly heat advancing the resin, so that the resin in the dried, impregnated paper can flow to consolidate and bind the sheets when pressed together in a heated press. E.G.S.

ROOFING FELTS—TESTING

PEROT, JULES J., JR., and CAWLEY, GEORGE. Tensile testing device. U. S. patent 2,597,812. Filed Dec. 12, 1947. Issued May 20, 1952. 1 claim. Assigned to The Patent and Licensing Corporation. [Cl. 73-15.6]

A device is adapted for use in combination with a standard tensile tester to provide an apparatus for determining the tensile strength of a sample of roofing felt while immersed in a hot asphalt saturant. The device comprises a vessel which contains a quantity of hot, liquid asphalt, clamping means for securing one end of the felt sample, and displacement means for maintaining the asphalt at a desired level in the vessel. 7 figures. E.G.S.

SETUP BOXES

FULLER, MILFORD E. Method of applying lace and like ornamental edging to boxes. U. S. patent 2,600,105. Filed May 12, 1948. Issued June 10, 1952. 1 claim. Assigned to Vickers-Armstrong Limited. [Cl. 93-57]

A method is described for the gluing of a strip of lace material to the inner top edge of a decorative box. 9 figures. E.G.S.

SHIPPING CONTAINERS

HOLLINSHEAD, JAMES A. Container. U. S. patent 2,598,123. Filed Oct. 11, 1949. Issued May 27, 1952. 2 claims. Assigned to Consolidated Paper Company. [Cl. 229-16]

A re-usable cardboard or fiberboard beer case is provided with a pair of flanged, hinged lid sections as a top closure and handholes at the ends to permit ready handling. 16 figures. E.G.S.

REESER, HARRY C. Container for shipment of eggs. U. S. patent 2,597,846. Filed March 1, 1949. Issued May 27, 1952. 3 claims. Assigned to The Patent and Licensing Corporation. [Cl. 229-15]

A corrugated or fiberboard compartmented shipping container for eggs is assembled from lightweight flat blanks which are designed to provide a double thickness of material on the bottom and end walls of the container and a load-sustaining transverse partition. 10 figures. E.G.S.

REESER, HARRY C. Egg container. U. S. patent 2,597,848. Filed July 19, 1949. Issued May 27, 1952. 3 claims. Assigned to The Patent and Licensing Corporation. [Cl. 229-15]

A corrugated or solid fiberboard compartmented shipping case for eggs is provided with a detachable cover which can be securely locked to the body of the container, and is constructed with two-ply end, side, and bottom walls. The double thickness of material serves as a shock-absorbing cushion and reinforces the container. 11 figures. E.G.S.

REESER, HARRY C. Egg shipping container. U. S. patent 2,597,845. Filed March 1, 1949. Issued May 27, 1952. 6 claims. Assigned to The Patent and Licensing Corporation. [Cl. 229-15]

A compartmented shipping case for eggs is formed from two identical flat blanks of corrugated or fiberboard and a centrally located transverse partition member which divides the case into two compartments. 8 figures. E.G.S.

REESER, HARRY C. Shipping container for eggs. U. S. patent 2,597,847. Filed March 1, 1949. Issued May 27, 1952. 2 claims. Assigned to The Patent and Licensing Corporation. [Cl. 229-15]

A shipping case for eggs is assembled from three flat blanks of corrugated or fiberboard which are designed to provide a two-ply shock-absorbing cushion on the bottom, side, and end walls of the container. 6 figures. E.G.S.

ROBINSON, KENNETH V. Prepackaging unit for rayon yarn and the like. U. S. patent 2,597,377. Filed March 20, 1948. Issued May 20, 1952. 2 claims. Assigned to Atlanta Paper Company. [Cl. 229-87]

A paperboard shipping container for conical or cylindrical packages of wound rayon yarn incorporates means for positioning the supporting cores positively against movement so that the packages are maintained entirely free of contact with the container or with each other. 11 figures. E.G.S.

WOLFE, RAYMOND E. Shipping and carry-out carton. U. S. patent 2,599,800. Filed March 4, 1949. Issued June 10, 1952. 2 claims. Assigned to The Fairfield Paper and Container Company. [Cl. 229-39]

A shipping carton and carrier for bottled goods is constructed with interlocking vertical partitions. A portion of the cover which is normally folded into the carton during shipment may be folded outwardly to form a carrying handle. 6 figures. E.G.S.

TALL OIL

PETERS, CARL F. Production of cyclopentadiene-tall oil compositions. U. S. patent 2,598,424. Filed Oct. 9, 1946. Issued May 27, 1952. 11 claims. Assigned to Velsicol Corporation. [Cl. 260-97.5]

A varnish and lacquer coating composition which possesses excellent resistance to acid, alkali, and water is prepared by polymerizing cyclopentadiene at 400-550°F. to its polyene resinous polymers, and subsequently reacting the polymers with tall oil at 400-650°. E.G.S.

VANILLIN

FISHER, JOHN H., and MARSHALL, HARRY B. Method of producing vanillin, acetovanillone and other oxidation products. Canadian patent 483,827. Filed Feb. 2, 1952. Issued June 3, 1952. 11 claims. Assigned to The Ontario Paper Company, Limited.

This corresponds to U. S. patent 2,576,752 (*cf.* B.I.P.C. 22:386) and is a reissue of Canadian patent 467,552 (*cf.* B.I.P.C. 21:144). E.G.S.

FISHER, JOHN H., and MARSHALL, HARRY B. Method of producing vanillin, acetovanillone and other oxidation products. Canadian patent 483,828. Filed Feb. 2, 1952. Issued June 3, 1952. 5 claims. Assigned to The Ontario Paper Company, Limited.

This corresponds to U. S. patent 2,576,753 (*cf.* B.I.P.C. 22:386) and is a reissue of Canadian patent 467,553 (*cf.* B.I.P.C. 21: 144). E.G.S.

FISHER, JOHN H., and SANKEY, CHARLES A. Method of producing vanillin, acetovanillone and other oxidation products. Canadian patent 483,829. Filed Feb. 2, 1952. Issued June 3, 1952. 8 claims. Assigned to The Ontario Paper Company, Limited.

This is the same as U. S. patent 2,576,754 (*cf.* B.I.P.C. 22: 386) and is a reissue of Canadian patent 467,554 (*cf.* B.I.P.C. 21:144). E.G.S.

SCHOEFFEL, EUGENE W. Manufacture of vanillin. U. S. patent 2,598,311. Filed May 4, 1950. Issued May 27, 1952. 12 claims. Assigned to Salvo Chemical Corporation. [Cl. 260-600]

A method for the production of vanillin from alkaline spent sulfite liquor comprises the steps of subjecting the liquor to the action of oxygen at a temperature above 200°C. and under a pressure of about 1000 p.s.i. for not more than 10 minutes, rapidly cooling the treated liquor to about room temperature, and separating vanillin from the cooled liquor. E.G.S.

WAXES

HILL, JOSEPH B., and FERRIS, SEYMOUR W. Wax product and process for preparing the same. U. S. patent 2,598,257. Filed May 29, 1948. Issued May 27, 1952. 4 claims. Assigned to Sun Oil Company. [Cl. 196-149]

A wax product which is suited for the lamination of paper products required to withstand high temperatures has a melting point of about 190°F., an A.S.T.M. penetration of about 20, and a Saybolt viscosity of about 145 seconds at 210°, and does not increase the translucency to visible light of uncoated sulfite paper when compressed in contact with the paper. The paper is characterized by an increase in translucency to visible light when maintained in contact with oil for 24 hours in an air bath at 120°. 2 figures. E.G.S.

WET STRENGTH

DANIEL, JOHN H., JR., WILSON, LUCIUS H., HASTINGS, RANDALL, and LANDES, CHESTER G. Application of dispersed coating materials to cellulosic fibers. U. S. patent 2,601,597. Filed Sept. 6, 1946. Issued June 24, 1952. 7 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

A method is described for the impregnation of paper stock with a cationic polyamine-halohydrin resin. This corresponds to Canadian patent 458,318; *cf.* B.I.P.C. 19: 901. E.G.S.

DANIEL, JOHN H., JR., WILSON, LUCIUS H., HASTINGS, RANDALL, and LANDES, CHESTER G. Application of dispersed materials to cellulosic fibers. U. S. patent 2,601,598. Filed Dec. 26, 1947. Issued June 24, 1952. 4 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

A method is described for the impregnation of paper stock with a cationic urea-formaldehyde-polyfunctional organic nitrogen-base resin. This corresponds to Canadian patent 461,850; *cf.* B.I.P.C. 20:377. E.G.S.

NILES, GEORGE E. Thermosetting resins and process of preparing same. U. S. patent 2,601,665. Filed Oct. 29, 1949. Issued June 24, 1952. 20 claims. Assigned to Monsanto Chemical Company. [Cl. 92-21]

A thermosetting resin composition is suitable as a beater additive in the manufacture of high-wet strength paper. As an example, one mole of urea and 2.5 moles of formaldehyde (as a 37% solution) are stirred together, and the pH is adjusted to 7.5-8.0 with caustic soda. The mixture is heated for one hour at 60-70°C., after which 0.065 mole of the sodium salt of 2-naphthol-3,6-disulfonic acid is added. The resulting solution is subjected to a vacuum of 30-40 mm. of mercury and maintained at 40-50° until it contains 60% resin solids. The pH of the solution is adjusted to 4.5 with sulfuric acid, after which the solution is heated at 90-95° under reflux and with agitation until the viscosity of the solution is 6 poises, as measured with the Gardner-Holdt bubble viscometer; the reaction requires about one hour. The pH of the solution is raised to 7.5-8.0 by the addition of caustic soda, and the solution is cooled to about 25°. A 15-mm. wide strip of a sulfite handsheet impregnated with 2% of resin solids from the above solution exhibits a Schopper wet tensile strength of 5.0 lb./inch after 16 hours' immersion in water, whereas the strength of a control handsheet is 1.75 lb./inch. E.G.S.

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